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ANALYSIS OF THE CORRELATION LINKS BETWEEN INDICATORS OF WATER QUALITY AND MORBIDITY OF CHILDREN IN THE RURAL TAXONS OF THE DNEPROPETROVSK REGION

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Authors have shown the influence of some components of the chemical composition of potable water in the six rural taxons of the Dnepropetrovsk region (Zn, Cu, Mn, pH, F, Al, ammonium nitrogen, nitrites, nitrates, oxidation) on the incidence of the following diseases in the 14 y.o. children: blood circulation system diseases, tumours, blood and blood organs diseases, anaemia, nervous system diseases, congenital anomalies, i.e. blood circulation system diseases ($p < 0.05$). Significant correlation was determined between general rigidity and iron in the potable water and blood and blood organs diseases, and anaemia in children in the majority of rural taxons (r=0.58 – 0.79); between anaemia and content of chlorides and sulphates in the centralized water sources ($r = 0.87$) ($p < 0.05$).

Keywords: rural taxons, children population, correlation, potable water.

Conference participants,
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Open European and Asian research analytics championship

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Background.

Official statistical data reveals the tendency to increasing morbidity and decreased levels of physical activity among children aged from 15 to 17. The period of childhood is the most sensitive from the point of view of influence of environmental factors. Factors of the school environment play the key role in formation of psycho-physiological and physical traits of children and adolescents.

Aim of the research: influence of quality of the drinking water from the centralized water supply sources on the children morbidity in the separated rural taxons of the Dnepropetrovsk region for the period of 2008-2013.

Materials and methods.

Objects of the research are children population – inhabitants of rural taxons of the Dnepropetrovsk region. Retrospective study covered the disease prevalence and assessment of morbidity among children population (under 14) in the rural taxons of the Dnepropetrovsk region for 2008-2013 on the basis of official statistical data from the documentation of different institutions within the system of the Ministry of Healthcare of Ukraine.

Results and discussion.

Results of our research have shown the correlation links between diseases in children and significant influence in the centralized drinking water sources in the 1st taxon – dry residue, chlorides and sulphates: moderate correlation ($r = 0.50$, $p < 0.05$); in the 2nd taxon – total hardness ($r = 0.82$); dry residue, chlorides, sulphates, calcium and magnesium – strong correlation ($r = 0.83$, $p < 0.05$); in the 3rd and 4th taxons: dry residue, chlorides, sulphates, calcium, magnesium – an average correlation ($r = 0.50$, $p < 0.05$); in the 5th tacson: dry residue, chlorides, sulphates, calcium, magnesium and iron ($r = 0.50$, $p < 0.001$); in the 6th tacson: dry residue, chlorides, sulphates, calcium and magnesium – strong correlation ($r = 0.87$, $p < 0.05$).

Analysis of morbidity among villagers – children in the 1st tacson allowed to identify strong and average correlation links between tumours and calcium and magnesium ($r = 0.43$, $p < 0.05$), anaemia – and calcium and magnesium ($r = 0.32$, $p < 0.05$), nervous system diseases – and calcium and magnesium ($r = 0.35$, $p < 0.05$), circulatory system diseases – and calcium, magnesium, iron ($r = 0.87$, $p < 0.05$), digestion organs diseases – and dry residue, chlorides, sulphates ($r = 0.39$, $p < 0.05$), respiratory system diseases – and total hardness ($r = 0.78$, $p < 0.05$), dry residue, chlorides, sulphates ($r = 0.63$, $p < 0.05$). Significantly strong correlation was found between dry residue, chlorides, sulphates and the following diseases: skin and subcutaneous tissue ($r = 0.71$, $p<0.05$), musculoskeletal system ($r=0.78$, $p < 0.05$), urinary system ($r = 0.87$, $p < 0.05$). On the other hand, content of calcium, magnesium and iron in the drinking water from the centralized sources caused a strong relationship between congenital anomalies ($r = 0.74$, $p < 0.05$) and congenital anomalies of the circulatory system ($r = 0.77$, $p < 0.05$) among children, living in this taxon.

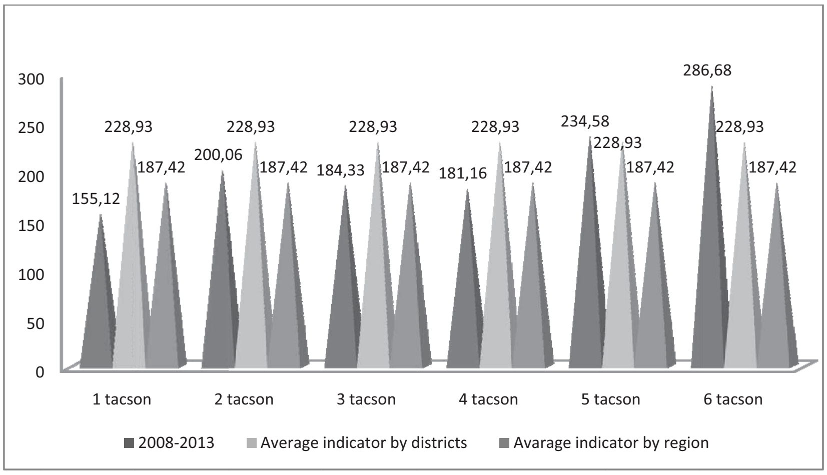

Fig. 1. Anaemia cases in 14 y.o. children, by average annual indicators, in the separate taxons of the Dnepropetrovsk region during 2008-2013 (cases per 10 000 children).

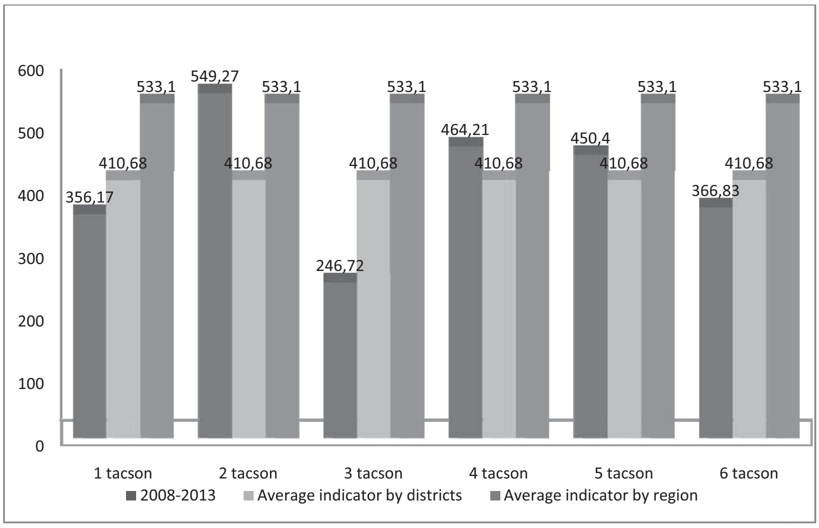

Fig. 2. Incidence of infectious and parasitic diseases in 14 y.o. children, by average annual indicators in the separate taxons of the Dnepropetrovsk region during 2008-2013 (cases per 10 000 children).

In the 2nd taxon one should pay attention to the strong correlation link between neoplasms in the 14 y.o. children – and iron ($r = 0.87$), blood and hematopoietic organs diseases – and total hardness ($r = 0.78$) and iron ($r = 0.74$), anaemia – and iron ($r = 0.79$), endocrine system diseases – and total hardness ($r = 0.88$), dry residue, chlorides, sulphates, calcium and magnesium ($r = 0.83$), respiratory system diseases – and total hardness, dry residue, chlorides, sulphates, calcium and magnesium ($r = 0.73$), congenital anomalies – and iron ($r = 0.74$), congenital anomalies of blood circulation organs – and iron ($r = 0.77$) ($p < 0.05$).

Analysis of correlation matrices, conducted among children in the 3rd taxon has shown a significantly high relationship between: neoplasms – and iron content ($r = 0.87$), blood and hematopoietic organs diseases – and total hardness ($r = 0.78$), dry residue, chlorides, sulphates, calcium and magnesium ($r = 0.32$), iron ($r = 0.95$), anaemia – and total hardness ($r = 0.58$) and iron ($r = 0.79$), endocrine system diseases – and total hardness ($r = 0.88$), dry residue, chlorides, sulphates, calcium, magnesium ($r = 0.74$) and iron ($r = 0.93$), nervous system diseases – and iron ($r = 0.87$), circulatory system diseases – and iron ($r = 0.74$) ($p < 0.05$). Significantly strong correlation in this taxon was observed between diseases of the respiratory system and total hardness ($r = 0.87$), dry residue, chlorides, sulphates, calcium, magnesium ($r = 0.95$), congenital anomalies of the circulatory system – and iron content ($r = 0.87$) ($p < 0.05$).

In relation to the 14 y.o. children in the 4th taxon the probable impact was defined: iron – on the tumors and hematopoietic organs diseases ($r = 0.87$), anaemia and nervous system diseases ($r = 0.95$), cardiovascular diseases ($r = 0.93$), congenital anomalies ($r = 0.87$), i.e. anomalies of the circulatory system ($r = 0.71$); total hardness – on the respiratory system diseases ($r = 0.87$), as well as dry residue, chlorides, sulphates, calcium and magnesium ($r = 0.84$) ($p < 0.05$).

In the water of 5th taxon authors determined a strong correlation between incidence of children diseases as well as hematopoietic organs diseases – and total hardness ($r = 0.78$), anaemia – and over-normal content of chlorides and sulphates ($r = 0.87$), endocrine system diseases – and dry residue ($r = 0.87$), respiratory system diseases – and dry residue, chlorides, sulphates, calcium and magnesium ($r = 0.83$) ($p < 0.05$).

The majority of drinking water quality indicators in the 6th taxon significantly influenced the morbidity level (average and strong correlation): total hardness – on the hematopoietic organs diseases ($r = 0.78$), anaemia ($r = 0.58$), diseases of the endocrine system ($r = 0.49$), circulatory system ($r = 0.39$), respiratory ($r = 0.82$), digestion system ($r = 0.65$), skin and subcutaneous tissue ($r = 0.58$), musculoskeletal system ($r = 0.42$) ($p < 0.05$). Similar trend was observed in relation to the iron content and the following diseases in children: tumours ($r = 0.87$), hematopoietic organs diseases ($r = 0.74$), anaemia ($r = 0.79$), diseases of the endocrine and nervous systems ($r = 0.80$), circulatory system diseases ($r = 0.78$) ($p < 0.05$) (Fig. 1).

In all rural taxons of the Dnepropetrovsk region authors have revealed common trend – strong correlation between some chemical indicators of drinking water quality (Zn, Cu, Mn, pH, F, Al, nitrogen ammonia, nitrites, nitrates and oxidability) and morbidity of 14 y.o. children with the following diseases: in the 1st taxon – circulatory system diseases ($r = 0.87$); in the 3rd taxon – tumours ($r = 0.87$), hematopoietic organs diseases ($r = 0.74 – 0.95$), anaemia ($r = 0.79 – 0.87$), diseases of the nervous ($r = 0.87$) and circulatory ($r = 0.74 – 0.95$) systems, congenital anomalies of the circulatory system ($r = 0.87$); in the 4th taxon – with tumours ($r = 0.87$), hematopoietic organs ($r = 0.87$), anaemia ($r = 0.74 – 0.95$), congenital anomalies ($r = 0.87$); in the 5th taxon – with tumours ($r = 0.87$), blood and organs of haematopoiesis ($r = 0.74 – 0.95$); in the 6th taxon – with tumours ($r = 0.87$), hematopoietic organs diseases ($r = 0.74 – 0.95$), anaemia ($r = 0.79 – 0.87$), circulatory system ($r = 0.75 – 0.78$) ($p < 0.05$).

Medium correlation between infectious diseases in children, consuming drinking water from the centralized water supply sources in the 2nd taxon and the following chemical substances was revealed: Zn, Cu, Mn, F, Al, nitrogen ammonia, nitrites and nitrates ($r = 0.30$, $p < 0.05$) (Fig. 2).

In relation to the drinking water of 1st taxon levels of the following diseases among 14 y.o. children strongly correlated: congenital anomalies – with all chemical indicators characterising the drinking water quality (Zn, Cu, Mn, F, Al, nitrogen ammonia, nitrites, nitrates), except pH and oxidability ($r = 0.74$), i.e. congenital anomalies of circulatory system ($r = 0.77$) ($p < 0.05$). In the 2nd taxon all chemical parameters, except pH, strongly correlated with tumours ($r = 0.87$), hematopoietic organs diseases

($r = 0.74 – 0.89$), anaemia ($r=0.79 – 0.87$); in the 4th taxon – all chemical parameters, except pH and nitrate, correlated with diseases of nervous ($r=0.87 – 0.95$) and circulatory system ($r = 0.83 – 0.93$); in the 5th taxon all chemical parameters, except pH, F and nitrate correlated with diseases of the nervous ($r=0.80 – 0.83$) and the circulatory system ($r=0.80$); in the 6th taxon – all chemical parameters, except pH, correlated with endocrine ($r=0.80–0.83$) and nervous system diseases ($r=0.80$) among children ($p < 0.05$). A strong correlation between diseases of the endocrine ($r=0.83$) and respiratory systems with pH was revealed ($r = 0.73$) in the 2nd taxon; diseases of the endocrine system correlated with pH, F, nitrates and oxidability – in the 3rd taxon ($r = 0.83 – 0.93$) ($p < 0.05$).

Conclusions.

1. Structure of morbidity among children in different taxons of the Dnepropetrovsk region varies by individual classes of diseases. In the 1st taxon the largest percentage rate was identified for such classes of diseases as X (65.36 %), XII (4.85 %), XI (4.42 %), I (3.23 %), IV (2.01 %); in the 2nd taxon: X (58.89 %), XII (6.09 %), XIII (5.01 %), I (4.61 %) and IV classes (5.21 %); in the 3rd taxon: X (66.29 %), XII (5.07 %), XI (3.94 %), I (2.11 %), IV classes (1.62 %); in the 4th taxon: X (56.27 %), XII (5.91 %), XI (5.02 %), I (5.93 %), IV classes (2.80 %); in the 5th taxon: X (64.63 %), XII (5.02 %), XI (4.02 %), I (4.02 %), III (2.14 %) and IV classes (2.29 %), in the 6th taxon: X (59.81 %), XII (5.31 %), XI (5.11 %), I (3.86 %), III (3.05 %), i.e. anaemia (3.02 %).

2. Taking into account the distribution of children by separate taxons, in the structure of all diseases authors have established higher incidence of diseases of the respiratory system, skin and subcutaneous tissue, digestive system, musculoskeletal system, infectious and parasitic ones, endocrine system diseases, hematopoietic organs diseases and anaemia among children in the majority of taxons of the Dnepropetrovsk region.

3. Correlation between salt composition of drinking water from the centralized water supply sources and morbidity among 14 y.o. children by the separate classes of diseases: neoplasm – correlation with high iron content in the 3rd and 4th taxons ($r = 0.87$); hematopoietic organs diseases – with total hardness in the 2nd, 3rd, 5th, and 6th taxons ($r = 0.78$); anaemia – with total hardness ($r = 0.58$) and iron content ($r = 0.79$) in the 3rd, 6th taxons; anaemia – with iron ($r = 0.95$) in the 4th taxon; anaemia – with high content of chlorides and sulphates ($r = 0.87$) in the 5th taxon ($p < 0.05$).

4. Correlation between some heavy metals in the drinking water taken from the centralized water sources (Zn, Cu, Mn, F, Al, nitrogen ammonia, nitrite, nitrate ($r = 0.74$)) and incidence of congenital anomalies among children was determined in the 1st taxon ($p < 0.05$).

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Charles Darwin
Gentlemen, you are criticizing my theory of evolution so indignantly... Your gestures and grimaces... All this once again proves me right
Idea by - B.Zhytnigor
Illustrator - Y.Simonov
International Academy of Science and Higher Education

MORAL AND ETHICAL PECULIARITIES AND PROBLEMS OF ORGANISATION OF THE PUBLIC HEALTHCARE SYSTEM IN UKRAINE

A. Gurkova
Odessa State Medical University, Ukraine

The problems of modern domestic medicine, based on the flaws in ideological-moral and ethical foundations of the public healthcare system, are analysed in the report. The impossibility to develop high-quality medical services without introduction of strict ethical standards of the profession and improvement of the doctors' social and legal responsibility level is substantiated. The author formulates a point of view that in conditions of obstructed realization of reforms in various other spheres of social life, such transformations could be the most effective in the sphere of medicine.

Keywords: medicine, medical institutions, medical services, Hippocratic Oath, life, health, morals, morality, reforms, responsibility.

Conference participant
National championship in scientific analytics

НРАВСТВЕННО-ЭТИЧЕСКИЕ ОСОБЕННОСТИ И ПРОБЛЕМЫ ОРГАНИЗАЦИИ СИСТЕМЫ ЗДРАВООХРАНЕНИЯ В УКРАИНЕ

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В статье анализируются проблемы современной отечественной медицины, вытекающие из изъянов в идеологическом – нравственно-этическом фундаменте системы здравоохранения. Обосновывается невозможность развития качественных медицинских услуг без формирования строгих этических стандартов профессии и повышения уровня социальной и юридической ответственности врачей. Формулируется позиция, что в условиях затрудненной реализации реформ в различных иных сферах социальной жизни, именно в медицинской отрасли такие преобразования могли бы оказаться наиболее эффективными.

Ключевые слова: медицина, медицинские учреждения, медицинские услуги, «клятва Гиппократа», жизнь, здоровье, мораль, нравственность, реформы, ответственность.

Участник конференции
Национального первенства по научной аналитике

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Независимо от того, какие специальности приобретает каждый из нас в учебных заведениях, какие должности занимает в профессиональной сфере или какого карьерного и социального статуса добивается в своей повседневной жизни, абсолютно каждому из нас необходимо и регулярно приходится обращаться за помощью в медицинские учреждения.

Так уж устроена природа человека, что качество и продолжительность его жизни во многом зависят от надлежащей профилактики здоровья, своевременности, оперативности и высокого уровня медицинского обслуживания. Безусловно, медицинские услуги в системе экономических ресурсов, коммерческих рынков и потребностей человеческого общества занимают особое место – положение, абсолютно невосполнимое какими-либо альтернативными продуктами. Значимость и ценность медицины для человеческого общества воистину невозможно переоценить. Зачастую, в различные исторические периоды истории общества, именно необходимость борьбы с заболеваниями, оказывала преимущественное влияние на революционное развитие науки, что, в свою очередь, кардинально стимулировало общественный прогресс. И все же, почему же столь велика значимость здравоохранения?

Все элементарно: жизнь и здоровье каждого человека во все времена являлись непосредственно для него персонально - величайшей ценностью, а квалифицированная врачебная помощь - востребованным и ценным ресурсом. В современную эпоху демократизации общественной жизни, либерализации коллективных ценностей, социальной справедливости и повышения стандартов жизнедеятельности общества, каждая человеческая жизнь обоснованно возведена в разряд глобального объекта общечеловеческой защиты. Естественно, в этой связи многократно возросли значение, ценность и ответственность медицины.

Каждый, кто считает возможным возложить на себя функции врача, должен осознавать высокую меру своей ответственности перед обществом…

К чему все эти достаточно высокопарные слова?

Давайте разберемся. Никому не составит особого труда воспроизвести в памяти стандартные лечебные заведения нашей страны… Часто неприспособленные для оказания качественных медицинских услуг, порой грязные и даже ветхие помещения. Повсеместное отсутствие необходимого медицинского оборудования надлежащего уровня и качественных лекарств. Вся эта плачевная ситуация, к сожалению, дополняется низким уровнем жизни населения и его объективной неспособностью самостоятельно обеспечить себя возможностью оплачивать качественные медикаменты и платные медицинские услуги.

Но, пожалуй, самый главный изъян отечественной системы здравоохранения заключается в кадровом потенциале медицинской сферы, точнее – в отношении значительной части врачей к своей профессии. Все дело в том, что по-настоящему квалифицированным медицинским работником действительно невозможно стать из соображений престижности, доходности профессиональной деятельности или иной карьерной перспективы. Медицина, без каких-либо оговорок, - это призвание. И любой, кто не готов добросовестно заботиться о здоровье окружающих просто потому, что иначе – нельзя, не вправе заниматься врачебной деятельностью. Иная ситуация – даже не аморальна, а преступна.

Возможно, если символическая «клятва Гиппократа» престала бы быть в отечественной медицинской среде просто формальностью, привлекательной архаикой, а приобрела бы реальный статус непреклонной профессиональной и жизненной позиции медика, качество услуг здравоохранения в нашей стране неизбежно и значительно выросло бы.

И тогда бы в стенах профильных университетов бесцельно не просиживали бы юные годы немотивированные студенты, а умудренные педагоги не излагали бы на лекциях избитые и морально устаревшие истины, не содержащие современные знания по медицинской проблематике. В таких условиях, возможно, ответственность врача за свои решения и действия в рамках медицинской практики не формировалась бы на срезе платежеспособности клиента, а предопределялась профессиональной гордостью и моральными обязательствами.

Конечно, в стране, находящейся в условиях тяжелых реформаторских преобразований социальной жизни, изнывающей под гнетом коррупции и хронической нехватки средств (в частности, на научные исследования и высокие социальные стандарты для населения), весьма сложно кардинально изменить положение вещей именно в медицинской сфере, которая, в отличие от судебной и правоохранительной систем, не имеет прямой связи с политическими процессами.

Однако, с другой стороны, вряд ли существует какая-либо иная социальная сфера, которая столь тесно была бы связана с насущными чаяниями людей, как медицина. Поэтому, в условиях, когда реформы в различных отраслях общественной жизни оказываются не результативными, именно в медицинской сфере прогрессивные преобразования могли бы получить массовую поддержку населения и возымели бы надлежащий эффект.

Конечно, в настоящий момент многие благие начинания в стране гибнут под прессом демагогии политиков, непрофессионализма функционеров, коррупции, отсутствия средств и преобладания формализма над целесообразностью. Однако жизнь и здоровье людей (в том числе - политиков) – это не формальные, а вполне реальные ценностные категории (особенно в условиях возникновения угроз этим ценностям), и в этой связи реальные медицинские реформы могли бы быть успешными. Однако начинать подобные преобразования следовало бы с формирования строгих этических стандартов медицинской профессии и повышения уровня социальной и юридической ответственности врачей. Подобные стандарты, конечно, необходимы в большинстве ключевых сфер социальной жизни, но именно для медицины они имеют ключевое – системообразующее значение.

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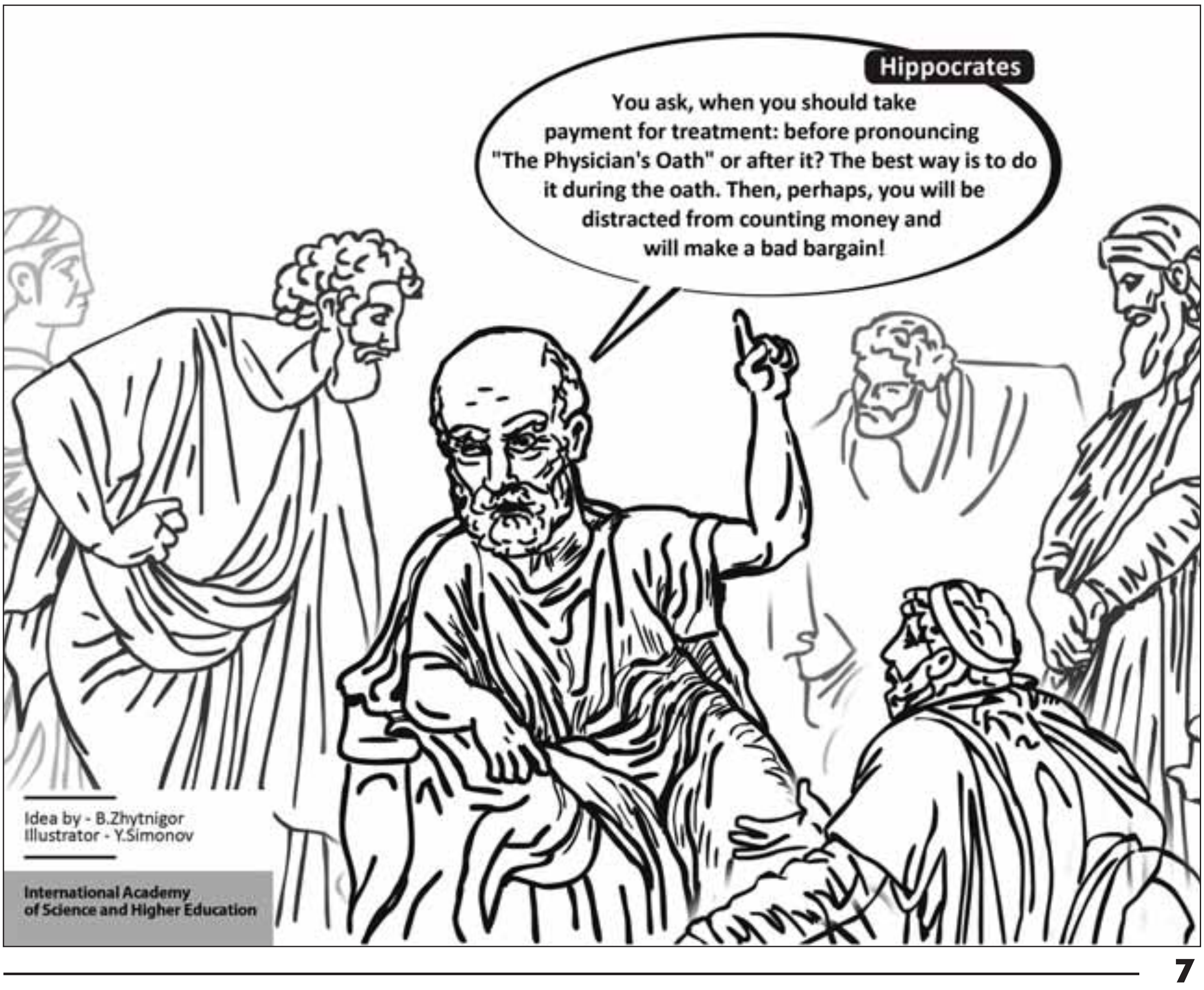
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PROBLEMS OF UKRAINIAN MEDICAL INSTITUTIONS AND THE SPECIFICITY OF PERSONAL AND PROFESSIONAL TRAITS OF THEIR DIRECTORS

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The peculiarities of functioning of modern medical institutions in Ukraine in conditions of a set of economic and political crises are considered in the report. It is stated that medical administrators are forced to fulfill a number of formal and informal administrative functions in order to keep hospitals and polyclinics operating. It is specified that now a significant volume of the current problems of domestic public health care are resolved at the level of heads of medical institutions.

Keywords: medical institutions, health care, head, administrator, crisis, crisis management, personal and business traits.

Conference participant
National championship in scientific analytics

ПРОБЛЕМЫ МЕДИЦИНСКИХ УЧРЕЖДЕНИЙ УКРАИНЫ И СПЕЦИФИКА ЛИЧНЫХ И ПРОФЕССИОНАЛЬНЫХ КАЧЕСТВ ИХ РУКОВОДИТЕЛЕЙ

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В статье рассматриваются особенности функционирования современных медицинских учреждений Украины в условиях череды экономических и политических кризисов. Утверждается, что медицинские администраторы, в целях поддержания деятельности больниц и поликлиник, вынуждены выполнять целый ряд формальных и неформальных административных функций. Указывается, что в настоящее время значительное количество текущих проблем отечественного здравоохранения разрешается на уровне руководителей медицинских учреждений.

Ключевые слова: медицинские учреждения, здравоохранение, руководитель, администратор, кризис, антикризисный менеджмент, личные и деловые качества.

Участник конференции
Национального первенства по научной аналитике

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Не только в научной литературе, но и в широкой общественной среде весьма часто обсуждаются как вопросы качества современных медицинских услуг, так и факторы реального влияния на эффективность деятельности медицинских учреждений их руководителей.

Конечно, роль руководителя велика в любой организации: он принимает ключевые решения, несет за них персональную ответственность, изыскивает ресурсы и возможности для достижения стоящих перед организацией целей.

Однако следует учесть, что глава медицинского учреждения должен являться не просто менеджером, но и профессиональным врачом высокого уровня, обладающим широкими познаниями в медицинской сфере, а также способным осуществлять эффективное антикризисное управление в условиях дефицита финансовых средств, а также специального оборудования и кадровых ресурсов надлежащего качества.

Важным обстоятельством является и то, что в условиях современной Украины, государственные медицинские учреждения являются неприбыльными дотационными организациями, имеющими крайне ограниченные возможности для надлежащего вознаграждения за труд квалифицированных медицинских специалистов.

В итоге известно, что в отечественной медицинской среде практикует немало плохо подготовленных врачей, а также распространены факты выплаты пациентами в пользу медиков незаконных платежей в качестве персонального вознаграждения за оказание помощи.

В условиях, когда государство не создает даже минимально допустимых условий для надлежащего функционирования медицинских учреждений и, по сути, оставляет больницы и поликлиники один на один с системными проблемами низкого уровня жизни в стране, дороговизны лекарств, невысокого уровня профильного образования специалистов, отсутствия необходимого оборудования и недоступности для населения эффективной диагностики и лабораторных анализов, именно руководители медицинских учреждений вынуждены нести бремя персональной ответственности за общее невысокое качество отечественного здравоохранения, низкий уровень доверия к медицине со стороны населения и её общее невысокое реноме, а также отсутствие строгих этических стандартов медицинской профессии и реальной социальной и юридической ответственности врачей.

Вместе с тем, все же следует отметить, что, несмотря на все указанные проблемы, система медицины в стране функционирует, и населению в целом оказывается количественно приемлемый объем медицинских услуг.

И в значительной мере подобное положение вещей – результат продуктивной деятельности руководителей медицинских учреждений.

Так какими же ключевыми качествами должен обладать руководитель отечественной больницы или поликлиники, чтобы в кризисных условиях их существования, обеспечить реализацию всех ключевых функций медицинского обслуживания населения?

Антикризисный менеджмент глав медицинских учреждений преимущественно выражается в изыскании дополнительных средств на ремонт помещений, оборудования и приобретения минимально необходимого объема лекарств для осуществления оперативных медицинских процедур.

Профессиональная квалификация таких руководителей вынуждено должна характеризоваться широким объемом знаний в различных сферах медицины. Подобный объем знаний позволяет глубоко вникать и понимать методические, кадровые и организационные проблемы функционирования различных отраслевых отделений учреждений.

Для сохранения надлежащего авторитета в коллективе, руководителям больниц и поликлиник надлежит квалифицировано разбираться в своей профильной медицинской специальности и осуществлять эффективное лечение соответствующих больных.

Личные и деловые качества указанных лиц неизбежно отличаются высокой коммуникабельностью, способностью «завязывать» связи и поддерживать их в значительном объеме в административной и коммерческой сфере.

Кроме того, руководители отечественных медицинских учреждений должны в своем лице сочетать качества эффективного кадрового психолога и мотиватора, способного обеспечить профессиональную деятельность врачей при любых условиях существования учреждений.

Очевидно, что современному медицинскому администратору в Украине необходимо обладать значительным количеством навыков и выполнять целый ряд функций, которые не имеют прямого отношения к медицине. В текущих условиях существования нашего государства лишь столь разнообразная и своеобразная компетенция ответственных медицинских работников способная обеспечить выживание здравоохранения. И именно в такой плоскости должны проходить надлежащую подготовку будущие и действующие администраторы медицинских учреждений.

Остается лишь надеяться, что в обозримом будущем таким руководителям, во имя достижения целевого результата, достаточно будет совмещать лишь формальные (без необходимости в неформальных взаимодействиях с третьими лицами) административные и исключительно профессиональные медицинские функции.

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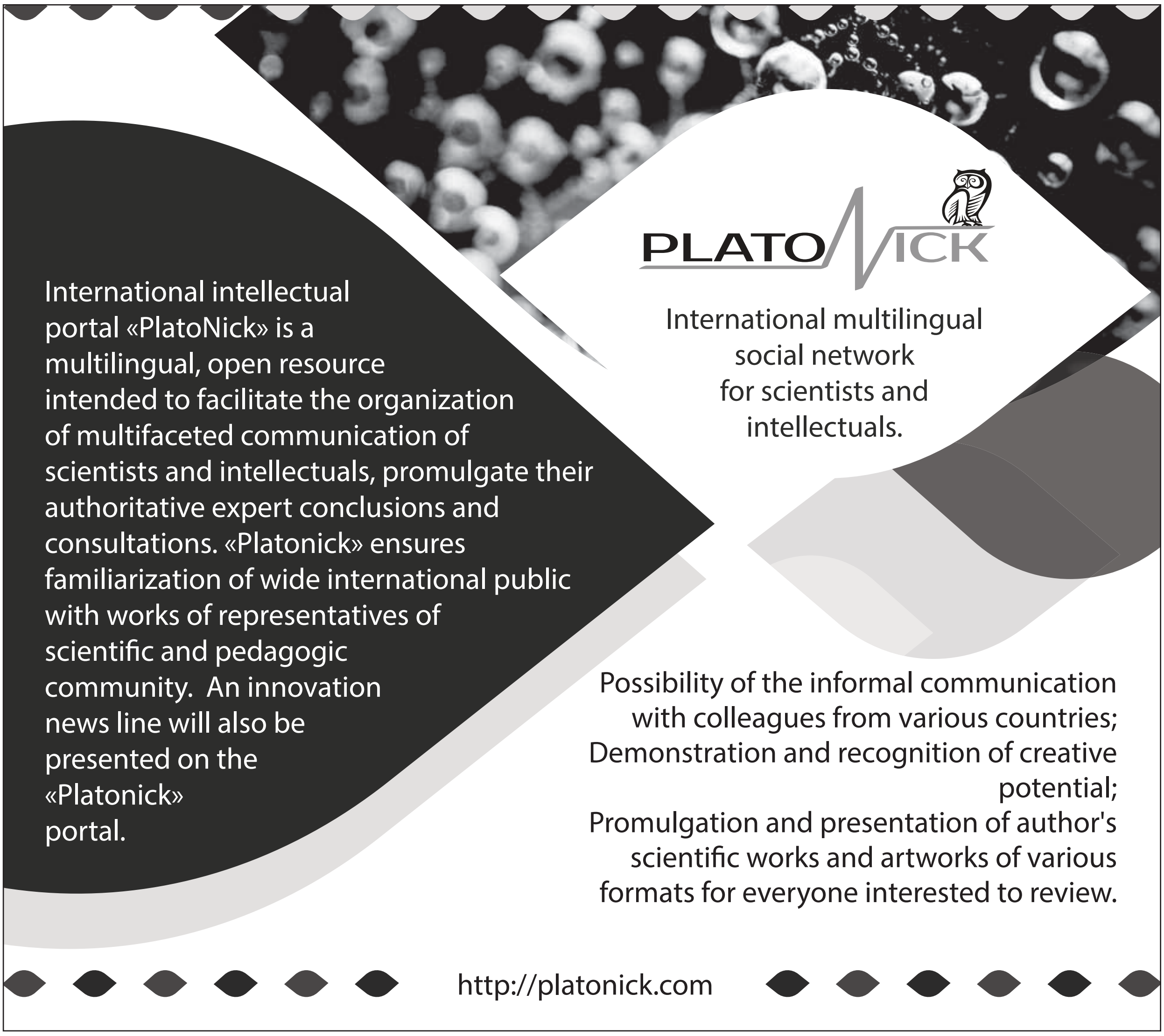
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CERTAIN CRITERIA OF ROLE IDENTIFICATION AND TACTICAL MODELLING OF THE PSYCHIATRIST'S BEHAVIOUR WHEN TREATING NEUROSES

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The necessity of role identification and tactical modelling of the psychiatrist's behaviour when treating neuroses is substantiated in the report. The author shows that establishment of trust between the doctor and the patient acts as one of the crucial factors of successful treatment. For this purpose the doctor must initially appear in the role partially corresponding to expectations of the patient, but at the same time demonstrating the strength of the doctor's identity and his confidence in effectiveness of the offered treatment.

Keywords: neurosis, psychiatrist, psychotherapist, psychiatry, role identification, behaviour model, treatment, verbal therapy, behaviour, communication, modelling, doctor.

Conference participant,
National championship in scientific analytics

НЕКОТОРЫЕ КРИТЕРИИ РОЛЕВОЙ ИДЕНТИФИКАЦИИ И ТАКТИЧЕСКОГО МОДЕЛИРОВАНИЯ ПОВЕДЕНИЯ ВРАЧА-ПСИХИАТРА ПРИ ЛЕЧЕНИИ НЕВРОЗОВ

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В статье обосновывается необходимость ролевой идентификации и тактического моделирования поведения психиатра при лечении неврозов. Обосновывается, что одним из определяющих факторов успешного лечения выступает установление доверия между врачом и пациентом. Для этого врач первоначально должен предстать в образе, который будет частично соответствовать ожиданиям пациента, но в тоже время отразит силу личности врача и его уверенность в успешности предлагаемого лечения.

Ключевые слова: невроз, психиатр, психотерапевт, психиатрия, ролевая идентификация, модель поведения, лечение, вербальная терапия, поведение, общение, моделирование, врач.

Участник конференции,
Национального первенства по научной аналитике

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В современной действительности, отличающейся высокими темпами развития общественных отношений, необходимостью оперативно адаптироваться к быстро изменяющимся условиям и принимать ответственные решения, значительное количество членов общества вынуждены разрешать практические профессиональные и житейские задачи на грани свих психических, интеллектуальных и физических возможностей. Естественно, в подобных условиях, с учетом генетических и психоэмоциональных особенностей и адаптивных способностей отдельных лиц, у многих из них возникают и развиваются невротические расстройства различной симптоматики, которые могут существенно ухудшать качество жизни больных.

Современная психиатрия предлагает достаточно большой выбор подходов и методик лечения неврозов различной этиологии. Однако, следует принять во внимание, что благоприятное течение процесса лечения неврозов во многом предопределяется уже характером первой встречи больного с врачом. От того, насколько правильно психиатр (психотерапевт) оценит внешние признаки поведения больного и произносимые им слова и, исходя из этого, определит ролевую тактику своего общения с собеседником и влияния на него, во многом будет зависеть установление надлежащего доверия между врачом и пациентом, а также эффективность процесса лечения невроза.

Очевидно, что, избирая ролевую тактику взаимодействия с больным, психиатру (психотерапевту) не следует полагаться исключительно на жалобы пациента и его оценочные суждения, ибо они могут преподноситься больным в несколько искаженном виде, в результате осуществления им адаптивно-оправдательной ревизии соответствующей информации. К сожалению, в советское время и в постсоветскую бытность государств – бывших республик СССР, в результате извращенного идеологического прессинга, психические заболевания и невротические расстройства в сознании населения необоснованно отождествлялись с явлениями постыдными и даже отвратительными. В тоже время, психика человека – это такой же органичный объект заботы здравоохранения, как и тело человека или его внутренние органы. Однако в сознании населения до сих пор бытуют архаичные стереотипы, преодоление которых во многом определяет оперативность и результативность лечения.

Зная указанные обстоятельства, врачу не следует полагаться исключительно на повествование пациента (многим больным изложение такой информации дается не просто – сродни исповеди), а внимательно отнестись к анализу его мимики, жестов и телодвижений.

Подобное исследование поведения больного со стороны врача должно быть проведено очень быстро, дабы пациент, столкнувшись с неопределенностью врача в выборе своей поведенческой позиции, не закрепостился и не отказался от откровенного общения.

Почему все эти обстоятельства важны?

Известно, что ключевым методическим аспектом лечения большинства неврозов, является вербальная терапия – беседа врача с пациентом. Дабы такая беседа была эффективна, врач должен расположить пациента к себе, вызвать у него необходимой доверие. Для достижения такого результата врач должен восприниматься пациентом, как лицо, заслуживающее доверия и, одновременно, способное излечить недуг. Это - весьма непростая задача, ибо поведенческие проявления неврозов у пациентов бывают самые разнообразные.

Вместе с тем, в большинстве случаев поведение лиц с невротическими расстройствами отличается пессимизмом, поникшим взглядом, плаксивостью, нерешительностью, заиканием и прерывистой речью, тревожностью. Очевидно, что при наличии подобного набора поведенческих признаков в разном сочетании, больной будет пытаться увидеть в личности врача не просто сочувствующего человека, а понимающую, но сильную (ибо свою личность больной оценивает, как весьма слабую, и для избавления от разного рода фобий склонен опереться на более сильного индивидуума) личность, которая с вниманием относится к проблемам пациента, но абсолютно уверена в их быстром преодолении. Необходимо ли врачу соответствовать ожиданиям такого пациента? И – да, и – нет. Дело в том, что, если такое соответствие не будет установлено невротиком, хотя бы по ряду ключевых признаков – необходимый контакт с врачом может просто не установиться. С другой стороны, абсолютное угождение чаяниям больного, может привести к ситуации, когда именно последний сочтет необходимым «вести» своё лечение, постоянно «встраивая» врача в свои ожидания. В этом случае, психиатр (психотерапевт) будет иметь недостаточное количество действенных инструментов влияния на пациента. Поэтому оптимальным, при прочих равных условиях, может быть вариант «гибкой силы»: когда врач расположит пациента к себе, например, «одноуровневой параллелью» (как вариант - рассказав больному о том, что «аналогичный случай был с ним лично или с родственником либо знакомым»), однако при этом не выкажет особого сострадания больному, а вместо этого, - по принципу «поведенческого доминирования» (возможно, даже до конца не дослушав о всех переживаниях пациента) – даст понять, что понимает суть соответствующих проблем и с абсолютной уверенностью понимает как их необходимо преодолеть.

А как же быть в ситуации, когда поведение пациента отличается очевидной раздражительностью или даже агрессией, основывающейся на его завышенной самооценке и обидчивости (такие обстоятельства, например, часто сопровождают визит больного к врачу под воздействием принуждения со стороны родственников)? В подобной ситуации врачу необходимо снять напряжение, основанное на «противодействии амбиций», когда больного раздражает тот факт, что он в качестве «подчиненного лица» пришел с визитом к некоему «авторитету». Дабы преодолеть подобную преграду в общении, врачу необходимо сформировать свою ролевую позицию «на уровне пациента» (например, узнав, кем работает больной, сразу обратиться к нему с определенным вопросом из объема его профессиональной компетенции). И лишь затем, в порядке настоятельного дружеского совета перейти к терапевтическому воздействию.

Конечно, с учетом потенциального неограниченного многообразия возможных поведенческих проявлений пациентов, далеко не всегда ролевая идентификация поведения врача может подлежать адаптации под базовые стереотипы.

Однако ключевым критерием тактического моделирования поведения психиатра должно быть не навязывание пациенту своего естественного (обычного) «исконного образа», а адаптация к состоянию и психотипу больного, с последующим выведением диалога на уровень оптимального и конструктивного вида вербальной терапии.

К сожалению, на практике врачи часто игнорируют необходимость оптимального моделирования своего общения с пациентом, ввиду трудоемкости и широкой вариативности такой процедуры, что часто осложняет процесс лечения неврозов.

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If you deny the presence of capillaries, erythrocytes and various microorganisms in your bodies, then you are absolutely justified in considering yourself to be the crude piece of a monolithic stone deprived of a brain and thoughts!
Antonie van Leeuwenhoek
Idea by - B.Zhytnigor
Illustrator - Y.Simonov
International Academy of Science and Higher Education

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PATIENTS WITH ACUTE MYOCARDIAL INFARCTION ABOUT SMOKING TOBACCO – AS A MODIFIED BEHAVIOURAL RISK FACTOR IN HUMAN HEALTH (BASED ON THE EXAMPLE OF POPULATION OF THE LVIV REGION)

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It was established that the interrelation between smoking experience among the investigated persons and the AMI morbidity (n=174, p<0,05), confirmed by the Pearson correlation coefficient (r="+" 0,58, with t >2) and the regression coefficient (R=0,45), showed the 0,45 times higher probability to get the AMI for active tobacco smokers during one year, than for those not consuming tobacco.

Keywords: health, tobacco, smoking, risk factor, myocardial infarction, prevention, doctor, primary level of medical support.

Conference participant,
National championship in scientific analytics

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Introduction. Nowadays, according to the WHO, the health status of the population of any country and each individual citizen is adversely affected by the way of life in 50-55% [1]. It is the well-known fact that the most harmful habit in the world is smoking [2]. Consumption of tobacco is recognized as one of the leading causes of health loss and premature mortality of the population [3]. That is typical and disappointingly regular in relation to public health of the population of both economically developed and the developing countries [4,5]. Confirmation of this is the fact that smoking is classified as a disease [F.17] [7] in the International Classification of Diseases (ICD-10) [6]. Statistical data shows that every year about 8 million people die from smoking-related diseases, the part of that number for Ukraine - 0.2 million [8].

For now, 64.5% of adult men smoke in Ukraine, which is 1.4 times more than the European index and 1.6 times more than world indicator [9]. The total number of tobacco consumers in Ukraine is about 9 million active smokers; it is representing one third of the working-age population, while the number of smokers is increasing by not less than 100 thousand inhabitants of the country annually [10].

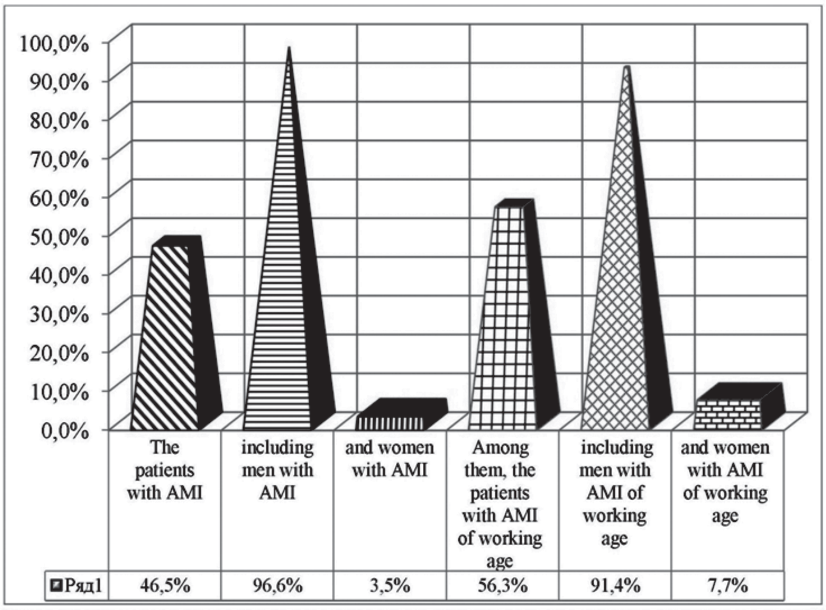
According to the WHO in Ukraine consumption rate of tobacco smoking reaches 1500-1800 cigarettes per year (4-5 cigarettes per day) for each citizen of the country, that is almost twice as much as the world's average (870 cigarettes per year) [11]. Spread level of smoking among adult population is 38,2%. Ukraine is on the 6th place among 45 countries in the WHO's European region and the 7th in the world after Greece, Nauru, Russian Federation, Austria, Serbia, Bosnia and Herzegovina [12].

The main point is that tobacco consumption continues to be one of the main causes of premature death from chronic non-infectious diseases. That's why the world health Assembly in May 2013 adopted the resolution WHA66.10 [13], which was approved by the global WHO action plan on non-infectious diseases prevention and control for 2013-2020. This is expected to reduce the prevalence of tobacco use by 30% by 2025, which is one of the main priorities in reducing the number of major non-infectious diseases in Europe [14], including the struggle against nicotine, aimed at improving people's health.

That's why study of the role of tobacco smoking in the way of life modified as harmful behavioural habit in the context of occurrence of acute myocardial infarction (AMI [I.21])) makes this research relevant in the scientific sense.

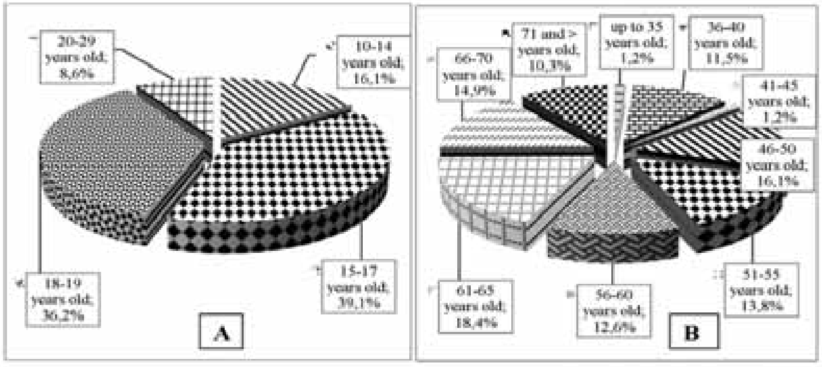
Aim of the research. The scientific substantiation of influence of tobacco smoking, as the modified behavioural risk factor in human, on the occurrence/development of acute myocardial infarction [I.21].

Materials and methods. In the course of scientific work the author used



Graph 1. The indexes of specific weight of patients with AMI [1.21] (n=374, with p<0,05), who actively consume tobacco (%) according to the sex division and working age

the method of “case-control” among the investigated (n=374 patients with AMI (t>2, p<0,05)) and control (n=374 persons who did not get sick with that disease (t>2, p<0,05)) groups formed by a number of residents of Lviv region. This allowed revealing the behavioural risk factors according to their negative impact on health state of a person in the context of AMI, including the tobacco smoking. The following methods were used: anamnestic, questioning, medical and statistical, analytical taking into account the principles of systematicity; the obtained data were consolidated and processed on a PC using the programs „Microsoft Office Excel 2010” and „SPSS”.



Graph 2. The data regarding the age of the beginning o the active smoking practice (A) and destribution of smokers by the age (%) (B) among persons from the numbers of patiens with AMI (1.21) (n = 174) (p < 0,05)

Results and discussion. Statistical analysis of the obtained data convincingly confirms that 46,5±3,5% (n=174) patients of the total number of examined patients due to AMI [I. 21] (n=374) acknowledge the existence of such behavioural addictions like tobacco smoking (see data of graph 1).

According to the values of OR=3,2, p<0.05 and DI=2,15-4,35, it was scientifically substantiated that smokers have 3,2 times higher probability of occurrence/development of AMI as compared to non-smokers. The results of the research indicate tobacco consumption confirmed by 96,6±7,4% (n=168) of males and 3.4±1,4% (n=6) females of the total number of smoking (n=174) patients with AMI, whereas persons of working age in this case amounted to 56,3±5,7% (n=98). Among males from this cohort this harmful habit was recorded in 91,4±8,9% (n=96) of cases, and among females this behavioural habit was confirmed only in 7,7±1,5% (n=2).

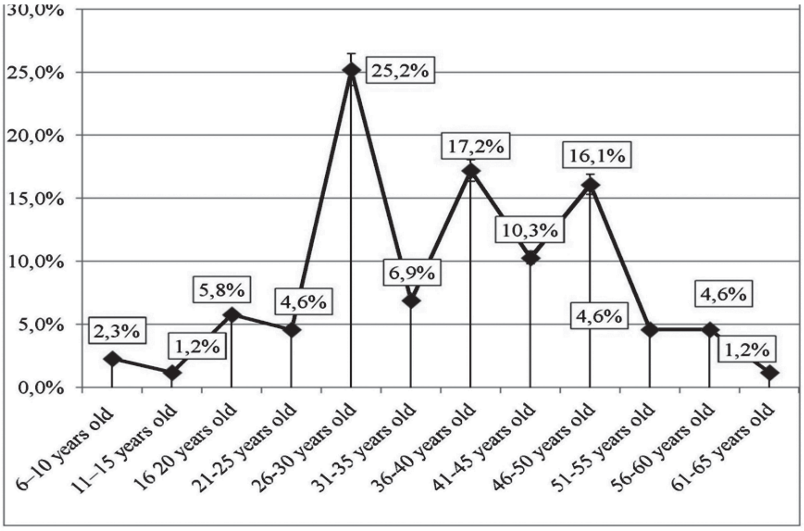
According to the data obtained, it was impossible to establish gender differences in active consumption of tobacco among patients with AMI.

The reasons to start smoking actively

Tab. 1.

REASONS TO START SMOKING TOBACCO ACTIVELY AMONG PATIENTS WITH AMI [I.21]

No.	Patients with AMI [I.21] about their reasons to start smoking tobacco actively	Indexes M+m (%)
1.	2.	3.
2.	The feeling of unity and community with the surrounding: «... Everyone smoked! I did not want to stand out. I’m not a black sheep».	121±26
3.	«The manifestation of maturity, rebellion against parents and in general against social pressure... It’s true freedom!!! I am independent from the thoughts of others!»	9,8±2,3
4.	«Wanted to comply with the modern lifestyle, emphasizing own individuality by smoking. It was the rage».	8,6±2,2
5.	Started smoking tobacco «out of curiosity».	8,0±2,1
6.	Referred to the «imitation of adults».	7,5±2,0
7.	Indicated on the «similarity of smoking with strength, courage and independence».	6,3±1,9
8.	Referred to the «new feelings. I want to try everything!»	5,7±1,8
9.	Noted «the inability to relax, to forget and to cope with stress».	5,2±1,7
10.	Reported on a «weak willpower».	5,2±1,7
11.	Could not reject this harmful habit when I just started smoking, and cannot quit smoking now.	4,6±1,6
12.	«A search for the meaning of life and spiritual emptiness «.	4,0±1,5
13.	«An example of parents».	4,0±1,5
14.	«A reason to get acquainted, a way to build joint communication, the basis of friendship».	3,5±1,4
15.	«Nervousness, anxiety».	3,5±1,4
16.	«The way to relax, calm down and rest. I want to forget the problems and relax».	2,9±13
17.	«An army service».	2,3±1,1
18.	«Weak willpower».	1,7±0,9
19.	«Failures in personal life».	1,7±0,9
20.	Career: «…to look more confident and respectable «.	1,7±0,9
21.	«An indirect promotion of smoking on television, in films, video».	1,1±0,8
22.	«The leaders» smoked: they gave orders to everybody, they were cool and everyone was afraid of them, everybody wanted to be like them, because no one could deny them».	0,6±0,6
Total		100 %



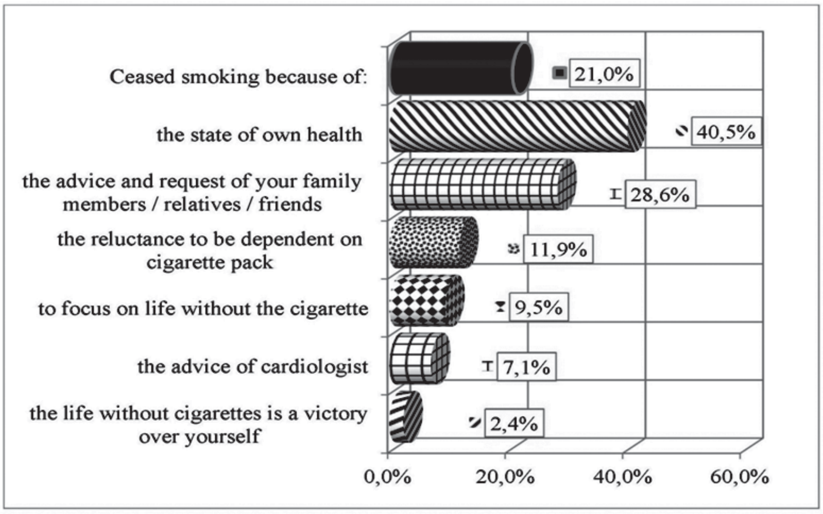
Graph 3. The indexes of duration (years, %) of tobacco smoking among patients with AMI (n = 174, p<0,05)

among patients with AMI (n=174) are presented in the table 1. It was established that during the development of this bad habit 7,5±2,1% (n=13) did not realize the harmful influence on own health status or didn't admit the full level of it. Whereas, 92,5±7,3% (n=161) of respondents mentioned their disbelief about this phenomenon.

The results of analysis of data regarding the age of starting the regular smoking practice of the examined persons show that on average patients with AMI started smoking at the age of 17±1.3, whereas the maximum number of active tobacco users (60,9±5,9%, p<0.05) observed among the respondents aged from 46 to 65 (Graph 2).

It was proved that the average period of smoking among patients with AMI (n=174) (Graph 3) is 41.3±3.1 years, whereas 75,9±6.6% of the respondents have great experience in smoking (26-50), 10,3±2,4% - very significant (51 years or more) and only 13.8±2.8% of respondents have medium experience in smoking (6-25 years). Thus, the daily average consumption rate was 21 cigarettes (men smoked $X_{average}$ = 31 cigarettes per day, and women smoked $X_{average}$ =11 cigarettes in the same period) [15].

In the course of the research author has established the interconnection between the years of smoking and morbidity in patients with AMI (n=174, p<0,05), where the Pearson correlation coefficient (r =+ 0.58; t >2) indicated the direct correlation of medium strength between the statistical characteristics.



Graph 4. Patients from the number of patients with AMI (n=42) about causes (%), that prompted them to stop smoking tobacco before the beginning of this disease

Using the regression coefficient (R=0.45) it was found that the tendency to the probability of getting sick with AMI is by 0,45 times higher when the duration of smoking is one year as compared to no smoking at all.

It was found that 21±3,2% (n=42) of respondents from the number of patients with AMI (n=200), who did not actively smoke in the course of the research, were also engaged in smoking before, but had overcome their own devastating behavioural phenomenon. The determining point of their choice was: the health status (40,5±9,8%, n=17); advice and requests of family members/relatives/friends (28,6±8,2% n=12); desire not to be "chained" to a pack of cigarettes (11,9±5,3%, n=5); desire to be focused on life without cigarettes (9,5±4,7%, n=4); advice of cardiologist (7,1±4,1%, n=3); life without cigarettes is victory over oneself (2,4±2,4%, n=1) (Graph 4).

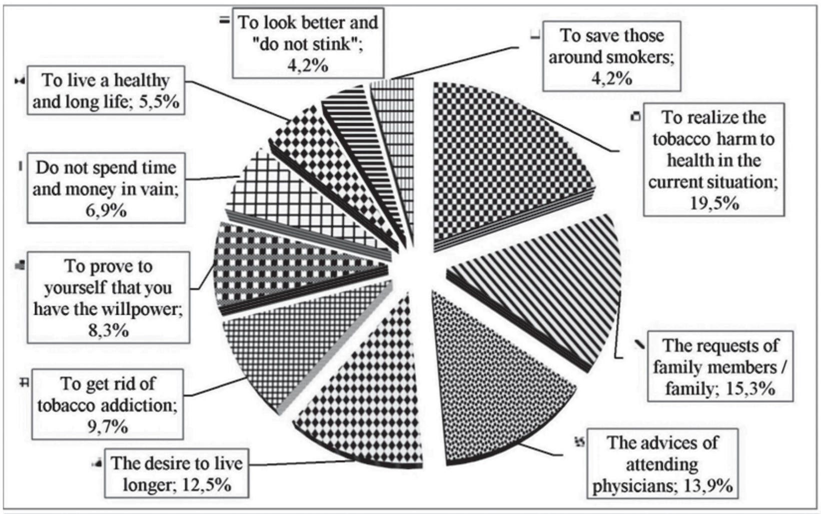
It was proved that almost a third (33,9±4,4%, n=59) of smoking patients with AMI (I.21), who smoked tobacco (n=174), at the time of the study stated that in their lives there had already been unsuccessful attempts to minimize the harmful behavioural effect on health - smoking tobacco through refusal.

It was claimed that 21,8±3,5% (n=38) respondents even having AMI (n=174) did not express any desire to give up smoking, while 36,8±4,6% (n=64) of patients considered that they were not ready to give up smoking, although already had that intention, and 41.4±4,8% (n=72) of respondents declared the intention to stop smoking.

Motives to get rid of the negative behavioural risk factors among the respondents (n=72) are presented in the graph 5.

All patients with AMI (n=174) were invited to answer the question: "Did the doctors actually ask about your harmful habit, and did you get any advice on how to get rid of smoking?" The following results were obtained: local therapists asked 72,4±6,4% (n=126) of respondents about smoking, while advice to get rid of this harmful behavioural habit was given to 62,7±6,6% (n=89) respondents.

The doctors of general medicine/



Graph 5. The respondents from the number of patients with AMI (n = 72) concerning motives (%) to get rid of negative behavior for own health AMI of working age the risk factor is tobacco smoking

family physicians expressed interest in the patient's smoking habit in 85,6±7,0% (n=149) cases, and gave the advice to minimize smoking to 68,4±6,7% (n=102) of respondents. Whereas cardiologists working in polyclinics asked their patients about smoking in 94.2±7.3% (n=164) cases, and the instructions to quit smoking were given to 90,8±7,4% (n=149) of patients.

The patients noted that emergency/ambulance doctors asked 39,1±4,7% (n=68) of respondents about smoking and in 55,9±9,1% (n=38) cases clearly and categorically recommended to quit smoking. In addition, we discovered that cardiologists of specialized hospitals in 93.1±7.3% (n=162) of cases asked about tobacco use on the first day of hospitalization; in the process of treatment in the hospital this question was raised again together with instructions to stop smoking tobacco because of its damage to health in 45.1±5,28% (n=73) of cases.

Conclusions.

1) The inclination of a person to smoke tobacco, as a risky behaviour leading to the occurrence/development of AMI, is in 92,5±7,3% cases based on misconceptions about the value of own health, in 33.9±4,4% - low self-esteem, and in 58.6±4.1% - insufficient motivation to change this behaviour.

2) It is proved that smoking as the behavioural risk factor is a behavioural habit harmful for health in the context of possible emergence and development of AMI; this is confirmed by correlation coefficients (r = "+" 0,58, t >2) and the regression coefficient (R=0,45).

3) It is substantiated that tobacco smoking, as a risk factor, is characterized by prolonged and chronic influence (years) of low concentrations of hazardous chemical compounds on the human body; this leads to the probability of eventual occurrence/development of AMI.

4) The essence of preventive measures is in minimizing the risk; the person is sent to doctors of the primary level of care having the strongest contact with the patients, as well as medical specialists from secondary and tertiary levels of health care practice in order to change own ideas about the value of own health and its importance for the quality of life.

The results of this research would have a positive impact on health and well-being of a human in practical health care through rejection of tobacco smoking. As it was mentioned before, reduction of prevalence of tobacco use by 30% in 15+ age category by 2025 is one of the main 4 priorities of WHO in reducing the number of major non-infectious diseases in Europe, aimed at improving the people's health.

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MODELLING THE TENSION OF ARTICULAR TUBERCLE BONE TISSUE IN THE TREATMENT OF HABITUAL DISLOCATION OF THE MANDIBULAR BONE IN PATIENTS WITH ANATOMICAL INSTABILITY OF THE TEMPOROMANDIBULAR JOINT

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The authors have studied the state of stress in the articular tubercle bone tissue of the temporomandibular joint in the course of treatment of habitual dislocation. The changes in stress depending on the angle of an implant-limiter and the height of the tubercle were established.

Keywords: temporomandibular joint, incomplete dislocation, implant, bone stress, end elements.

Conference participants,
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In modern literature, there are several theories of development of instability of the temporomandibular joint (TMJ). The most common and accepted is the theory according to which the TMJ anatomical instability is seen in some cases as a reactive, in others - as a pathological condition.

Pathological condition has unique clinical presentation, reflecting the characteristic changes: a defect of the support function of the articular surfaces, uncontrolled displacement of the mandible, occurrence of unusual articular displacement of the mandible head due to non-coordination of work of masseter muscles and inadequate movements of contacting joint surfaces, occurrence of gross intra-joint noise, development of a pain syndrome [2, 7].

Dislocation of the joint, as an evidence of instability in the relationship of it anatomical structures, is the result of violations of spatial location of its internal components in relation to each other in all three planes. This leads to the development of stress-strain state of the articular tissues as a result of changes in head position of the mandible in relation to the articular cavity and the articular tubercle, and also due to changes in the mechanical properties of the capsule and ligaments, articular tubercle defect [5].

The surgical treatment of TMJ instability in most cases is focused on the removal of specific defects. In order to do this, the following operations were conducted: condylotomy [4], immobilization of the disk with lavsan thread weaving [8], introduction of Tantalum limit screws in the bone tissue of the articular tubercles tops [3], restrictive ligation of the edge of the zygomatic arch with the edge of the mandible [9], plastics of the articular tubercle with cortical-bone matrix [1].

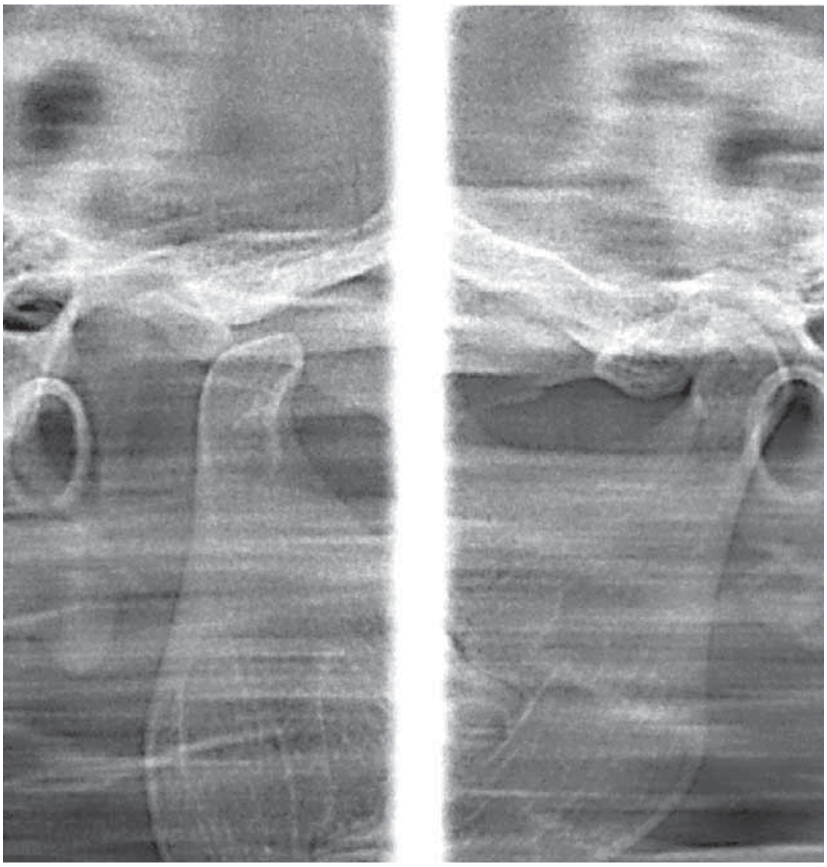

Fig. 1. Zonogram of temporomandibular joint

However, these interventions do not lead to long-term post-operative joint stabilization; hereinafter its hypermobility has developed.

The aim of our study was to examine the stress in the articular tubercle bone tissue in the course of treatment of habitual dislocation of the mandible in patients with anatomical instability of TMJ.

Materials and methods. Based on the X-ray zonography image of the TMJ (**Fig. 1**) with the help of SolidWorks software the models of the temporomandibular joint in the sagittal plane were built; they have been exported to the program complex ANSYS Workbench 14.0.

When constructing a mathematical model it was taken into account that the elastic modulus of the subchondral bone (Ec) is 6890 MPa, spongy (Er) - 689 MPa [10,11].

The following boundary conditions were taken for the calculations: the thickness of a compact bone - from 2 mm and up, the constant cartilage thickness - 2 mm, the contact between the articular cartilage of cavity and the head is provided by 5 contact elements; a compact, spongy bone and articular cartilage were considered as homogeneous components (isotropic).

The calculation of this model was made for medium and low altitude of the articular tubercle. The head of the lower jaw in two versions is installed in accordance with the norm. In a similar model we studied the effect of orientation of the head of eminoprosthesis-limiter of articular tubercle on the stress-strain state of the articular surface area. It was decided that the leg of eminoprosthesis-limiter was installed in the interior of the temporal bone, and the angulation of the head-limiter varied within the limits: 45^0, 60^0, 75^0. Titanium was used as an implant-limiter.

We studied the stress in the cortical and spongy bone tissue of the tubercle of the temporal bone under the location of titanium implant-limiter at different angulation and influence of the articular tubercle height on this process.

In order to characterize the state of stress and at the same time taking into account all the components of the stress fields (normal and tangential) the von-Mises equivalent stress in MPa was used.

The results of study. Flat mathematical model allows realizing the stress caused during mouth opening and lateral movements. Each part of the object (temporal bone, head of the mandible) in its coordinate system allows varying their relative positions.

Calculations have shown that the angle of inclination of the implant-limiter significantly affects the state of stress in the articular tubercle of the temporal bone.

Increase of the angulation of the head-limiter from 60^0 to 75^0 causes an increase in the compressive stress in the upper part of the articular tubercle. Stress concentration occurs in the area of "support" of the edge of the head-limiter on the top of the articular tubercle. Similarly, the stress in spongy bone is increasing. When placing the titanium implant under the angle of 75^0, the maximum intensity bordering on the limit arises, as the result of which the bone destruction may occur.

The orientation of titanium implant under the angle of 45^0 causes high tensile stresses in spongy bone, especially in the medial part of the mandibular cavity. In our opinion, such state of spongy bone, especially long-lasting, can cause its destruction.

The results of the study showed that the height of the tubercle is of great importance in the mechanical stress redistribution; it protects the spongy bone from the high compressive stress.

By reducing the height of the tubercle the stresses zone in the spongy bone is significantly extending, its dimensions are growing by the factor of 1.75. In conditions of loads which excess the physiological ones, the further growth of stress can cause resorption of the bone around the top of the tubercle and instability of other joint components.

The basis of the TMJ instability formation (both occlusive and anatomical) is the violations of biomechanical conditions of work of its structural components. These violations contribute to a false load distribution, which leads to local overload of elements of the joint, damage to structural-functional relationships and formation of the mechanism of incomplete unilateral habitual dislocation of the mandible. Dysplastic changed tissues have smaller range of compensatory and adaptive capacities, reduced "safety margin" of TMJ components.

This will gradually lead to formation of biomechanical irregularities in the form of uneven load distribution on articular surfaces, and will further promote instability [6]. Existing methods of surgical treatment of joint hypermobility, which can lead to the habitual dislocation, are intended to limit its mobility without consideration of factors of bone tissue tension. This leads to a short-term positive result in the postoperative period.

Conclusions. The results of our study showed that the boundary positions of the head of the titanium implant increase the mechanical stress of the system "bone-limiter"; this may impair its stability. The optimal position of the endoprosthesis socket assumes its inclination to the horizontal at the angle of 60º. There may be the variation of angle over 45^0, but less than 75^0. In order to prevent the growth of the damaging stresses in the articular tubercle plastics (to increase its height) is required.

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PATHOLOGICAL DYSREGULATIVE INTEGRATION OF NEURAL AND IMMUNE SYSTEMS IN CASE OF CHRONIC CONVULSIVE SYNDROME

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The paper contains the data related to the authors' experimental trials, which revealed the influence of cytokines – tumour necrosis factor-alpha (TNF) and interleukin-1-beta (IL-1) – on different forms of seizure syndrome initiation, progression and suppression. The modulating influence of cytokines on the development and termination of seizures is discussed together with the cytokines-induced changes of TNF and IL-1 levels in blood plasma and brain of infected rats. The authors made a conclusion about pathophysiologic mechanisms of the chronic convulsive syndrome accenting on the development of pathological dysregulative integration of neural and immune systems in case of experimental chronic convulsive syndrome formation, progression and termination.

Keywords: chronic convulsive syndrome, cytokines, tumour necrosis factor, interleukin-1, pathophysiologic mechanisms, dysregulative pathology.

Conference participants

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There is data on connection between the immune system dysfunction and the development of epilepsy. Results of clinical observations indicate the immune system dysfunction in patients with Rasmussen encephalitis [15] and Lennox-Gastaut syndrome. [4] Patients with epilepsy were reported to have elevated concentrations of interleukin-6 [6] in the cerebrospinal liquor, as well as the increasing concentrations of antagonists regarding receptors to interleukin-1 (IL-1) after tonic-clonic seizures [8].

Experimentally reproduced kainate-induced status epilepticus caused the growth of the intrahippocampal expression of mRNA IL-1, tumor necrosis factor (TNF) - alpha and other cytokines [7]. It was also shown that IL-1 introduction prolonged the period of kainate-induced seizures manifestation [12]. Both cytokines - TNF and IL-1 enhanced pentylenentetrazol seizures in mice [7].

Cytokines are likely to be able to modulate the excitability of the brain processes, and also to regulate the development of seizures, development and destruction of neurons, reactive gliosis and processes of nerve fibers "sprouting" [9, 11, 13, 14].

Considering the data given above, we have conducted a series of experiments aimed at determination of the role of cytokines under the conditions of the genetic model of the absence form of epilepsy and chronic kindling-induced seizure activity.

Purpose.

Substantiation of the formation of pathological disintegration of the nervous and immune systems through the study of the effect of TNF and IL-1 expression and frequency of spike-wave discharges (SWD) generation in WAG/Rij rats (with genetically determined absence form of epilepsy). An additional objective of the work was to determine the pathogenic role of the cytokine immune system in the electrical kindling by determining the influence of exogenous introduction of TNF on the content of the studied cytokines in the rat blood and brain tissue within the model of chronic convulsive syndrome.

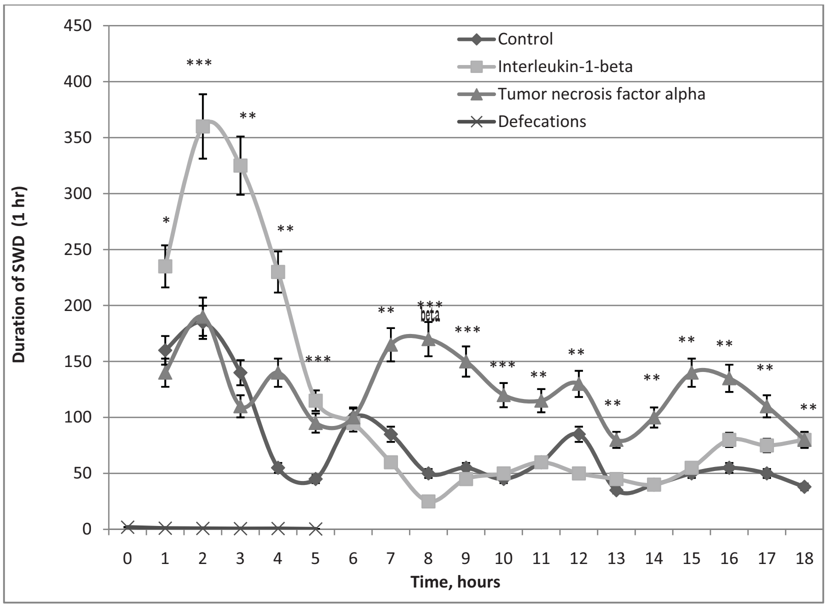

Fig.1. The effect of TNF and IL-1 on the duration of SWD generation in rats with genetically determined epilepsy of the absence form

Notes: The vertical dashed line separates the dark (the first 6 hours of the follow-up) from the light period of the day (the remaining 12 hours of the follow-up after injection of cytokines). * - P <0.05, ** - P <0.01 and *** - P <0.001 - reliable discrepancies of the studied indices compared to rats in the control group (ANOVA statistical double criterion).

Materials and methods.

Experimental studies were conducted under the conditions of chronic experiment on Wistar, WAG / Rij and ACI male rats with weight from 180 to 320 g. Work with experimental animals was carried out in compliance with fundamental ethical and regulatory requirements, and provided by the European Commission for Supervision of laboratory and other experiments involving experimental animals of different species, the Law of Ukraine

"On protection of animals from cruelty" of 21.02.2006, №3447-IV), and Commission on Bioethics of ONMedU (minutes N28 D of 9 November, 2012).

A model of electrical stimulation kindling was used to reproduce chronic convulsive syndrome by electric irritation of the tonsil through nichrome bipolar electrodes (0.10-0.15 mm in diameter and interelectrode distance of 0.20-0.30 mm), which were implanted in advance using a stereotactic technique [2]. In some series of kindlings exogenous introductions of TNF in the dose of 5.0 mg/kg were made in rats.

Investigation of TNF and IL-1 content was carried out in the blood and brain tissue of WAG/Rij and ACI rats, using the ELISA method with selective antibodies of the "Biotrak" system (Amersham Pharmacia Biotech, USA). Each determination was performed twice. Absorption of the antibodies was performed at a wavelength of 405 nm. The minimum specified level was 4.0 pg/ml. In each investigation of IL-1 content 0.416 mg of the tissue in the 50 ml of the tested solution were used. In the investigation of the TNF content the volume of the tissue was 10 times less.

The results obtained were calculated statistically. Minimum statistical significance was determined at p <0.05.

Results and discussion.

In 1 hour after intraperitoneal injection of the saline solution the duration of SWD generation in WAG/Rij rats was 161 ± 12 s, in 2 hours the index was 184 ± 14 s, after which the decrease of the studied index was recorded (Fig. 1). During further follow-up (light period of the day) the duration of SHP generation did not change significantly and was between 35 ± 4 up to 85 ± 9 s.

After the injection of IL-1 during the dark period of the follow-up there was a significant increase in the studied indices. In 1 hour after cytokine injection the duration of SWD generation in WAG/Rij rats was 46% as compared to the same period in control rats (p <0.05). In 2 hours of the follow-up the studied index value was maximum - 96% as compared to that of WAG/Rij rats, which were injected with the saline solution (p <0.001). During further follow-up the duration of SWD generation in rats, which were injected with IL-1, was significantly higher than the corresponding indices in the control group of rats on the 3rd hour (2.3-fold, p <0.01), on the 4th hour (4, 2-fold, p <0.01), on the 5th hour (2.6 times, p <0.001) of the experiment (Fig. 1).

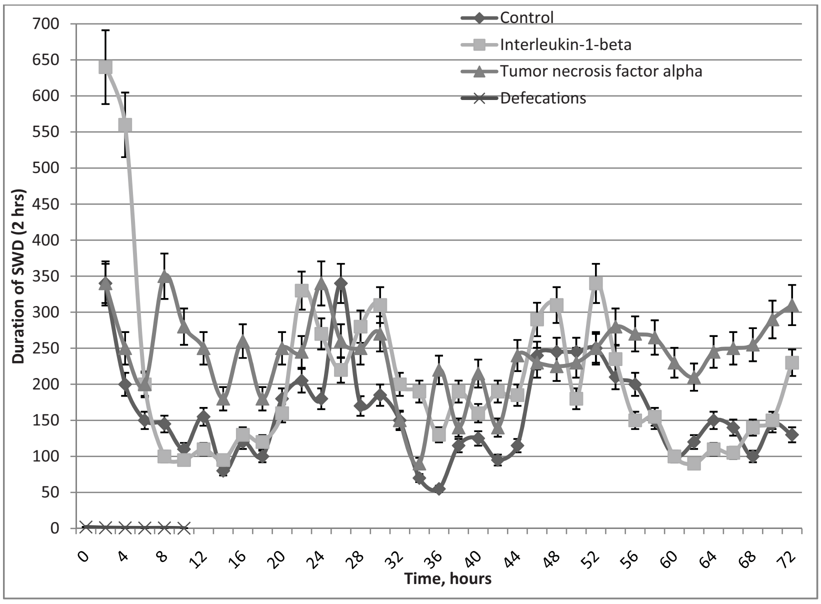

Fig. 2. The duration of SWD generation (averaged over 2 hours) for 72 hours after injection of TNF and IL-1 to rats with genetically determined absence form of epilepsy

Notes: The vertical dashed lines separate the dark period of the day (the first 6 hours of the follow-up during the day) from the light period of the day (from the 7th to 18th day of the follow-up).

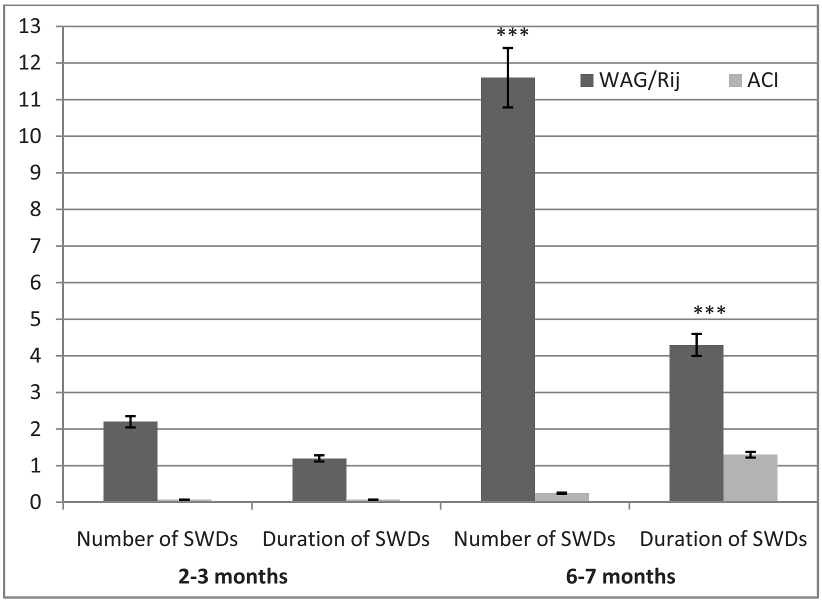

Fig. 3. The number of SWDs and their duration (in seconds) in WAG/Rij rats of different age

Note: *** - P <0.001 - reliable discrepancies of the studied indices compared to those in WAG/Rij rats aged 2-3 months (ANOVA statistic criterion + Newman-Keuls).

During the first 6 hours of the follow-up after the TNF injection (the dark period of the experiment) the duration of SWD generation in rats of both groups did not differ significantly as well (p > 0.05). But

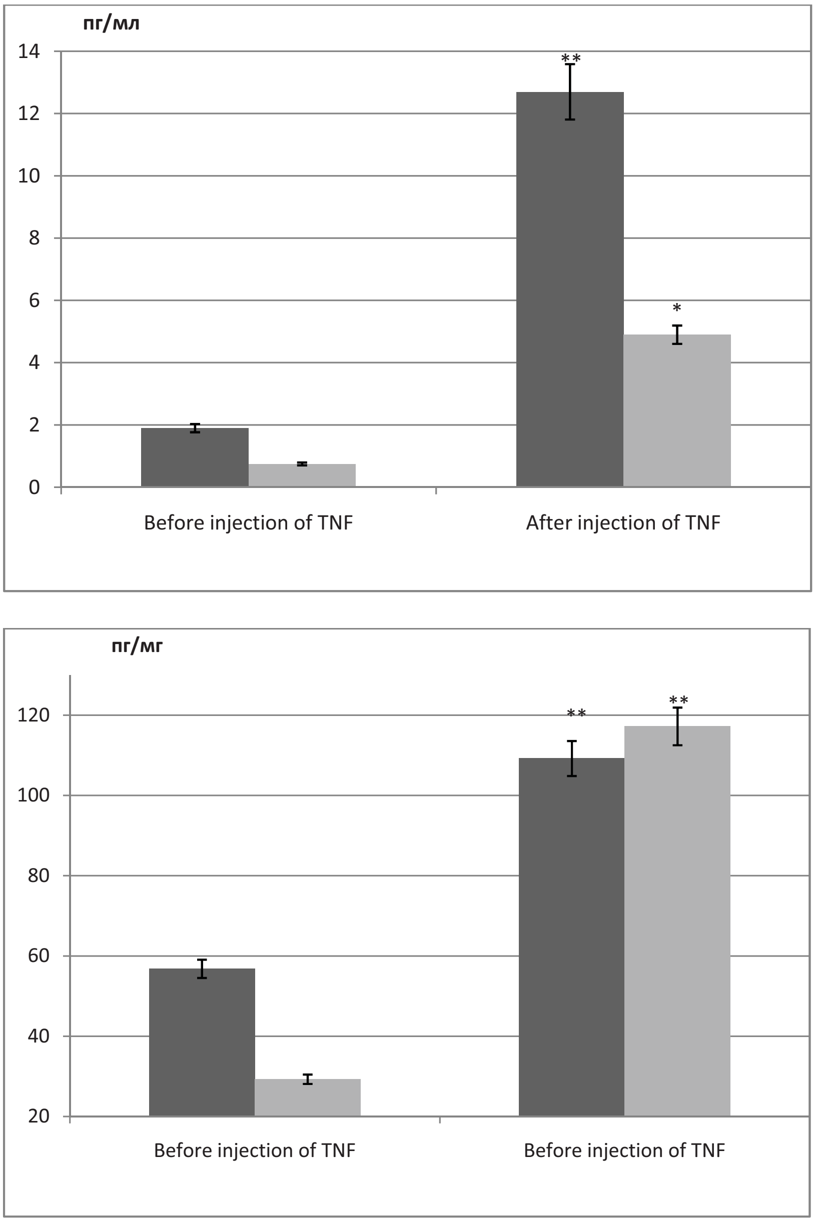

Fig. 4. The influence of i.p. TNF injection (5.0 mg/kg) on the content of TNF and IL-1 levels (fragment A) and the brain tissue (fragment B) of kindled rats.

Note: * - P <0.05 and ** - P <0.01 - reliable discrepancies of the studied indices compared to those in kindled rats before the TNF injection (ANOVA statistic criterion + Newman-Keuls).

in 7 hours after injection of cytokine the duration of SWD generation in WAG/Rij rats was by 66% higher as compared to the same period in control rats (p <0.01). In 8 and 9 hours of the follow-up the studied index values were 3.4 times and 2.7 times higher, respectively, as compared to the same index in WAG/Rij rats, which were injected with the saline solution (in both cases p <0.001; Fig. 1).

During further follow-up (from 10 to 18 hrs, the light period of the experiment) the duration of SWD generation in rats, which were injected with the TNF, exceeded considerably the corresponding indices in the control rats on average by 1.5 times (the 12th hr, p <0.01) - 2.7 times (the 10th hr, p <0.01; Fig. 1).

The effect obtained during the first day continued (Fig. 2) in registration of the SWD duration during the 2nd and the 3rd days after the injection of the studied cytokines, which showed non-randomness of the registered dynamics of changes in the SWD duration in WAG/Rij rats after injection of IL-1 and TNF during the 1st day.

At 2-3 months WAG/Rij rats showed the average number of SWD at 2.2 ± 1.1, and their duration was on an average 11.6 ± 2.5. In the control group of the follow-up (ASI rats of the similar age) spike-wave discharges could not be registered (Fig. 3). At 6-7 months WAG/Rij rats showed significantly higher average number of SWD (5.3-fold, p <0.001), as compared to the index in WAG/Rij rats aged 2-3 months. The SWD duration in WAG/Rij rats aged 6-7 months was 3.6 times higher than the corresponding index in these rats aged 2-3 months (p <0.001). ASI rats showed minimal values of the studied indices (Fig. 3).

Convulsive reactions in rats induced by electrical stimulation within tonsil testing in 24 hours after exogenous TNF injection were of generalized tonic-clonic nature, with the development of post-attack depression and autonomic disorders (Table).

While studying the dynamics of the TNF concentration in the blood and brain tissues of kindling rats before and after exogenous injection of investigated cytokines, its significant increase in the blood was registered (6.3-fold, p<0.01). Injection of TNF was accompanied by the significant (1.9 times, p <0.01) growth of its content in the brain tissue (Fig. 4, A).

Under the studied conditions a similar dynamics of changes in the IL-1 concentration in the blood and brain of kindled rats was revealed (Fig. 4, B).

Thus, the results obtained indicate a significant increase in the cytokine concentration in the brain and plasma of rats with a tonsil kindling. This should expand the results of examination of changes in TNF levels in WAG/Rij rats, genetically predisposed to absence seizures at the age of 2-6 months [3]. It was found out that the investigated cytokine content did not differ in the brain of WAG/Rij rats aged 2 months from the similar data in the control ASI rats. However, in the brain of the same rats aged 4 months the TNF levels have increased by 24%, while the corresponding indices have decreased by 12% in the brain of the control rats. Thus, the content of the investigated cytokine in brain of WAG/Rij rats aged 4 months was by 27% higher than the corresponding index in the control rats. Later on, on the 6th month of life indices of the TNF level did not differ significantly. Taking into account that WAG/Rij rats have maximum expressiveness of absence seizures at the age of 2-4 months, it is possible that there may be concurrence between the TNF content and intensity of the convulsive syndrome under the conditions of genetic model of generalized absence seizures, indicating a pro-convulsive role of this cytokine.

These data are consistent with the results of a series of experiments aimed at studying the effect of exogenously injected IL-1 on the SWD generation duration within the experimental model of genetically determined absence form of epilepsy. The cytokine injected to the intact WAG/Rij rats has increased durability of SWD generation in the first 5 hours after injection. The animals' brain activity was observed during 72 hours, and duration of SWD generation has also increased influenced by the other cytokine - TNF during the 7th to the 18th hr since the introduction. Thus, there were obtained different temporal characteristics of effects of two cytokines investigated on the duration of SWD. Perhaps, IL-1 increased the durability of SWD generation, increasing the inflow of calcium ions into the cells through interaction with NMDA-receptors. There may also be a mediated mechanism for implementation of this effect – by increasing the production of β-endorphins, which in their turn have increased the duration of SWD generation. Taking into consideration the "delayed" effect of TNF on the studied index, it seems that its effect was not a primary one, and was most likely induced by the effect of IL-1.

The investigations have revealed the significant growth of the TNF concentration in the brain and plasma of rats with tonsil kindling. The data indicates substantial disorders of the regulatory processes in the nervous and immune system in chronic EpA, which is an additional evidence for the formation of disintegration pathology in the studied conditions. We believe that in the chronic convulsive syndrome induced disintegration of the central nervous system is an essential compensatory activation of the immune system, which is actually a manifestation of cytokine release.

But in terms of electrical stimulation of the cerebellar tissue the TNF concentrations in the cerebral cortex and cerebellum did not differ significantly from those of a control group [10]. That is, while determining the TNF concentrations in tissues of the various brain formations under the conditions of electrical stimulation of the tonsil and cerebellum we expected to obtain different results, as the tonsil and cerebellum are related to different entities as to their possible impact on epileptogenesis. It is known that due to electrical stimulation of the tonsil EpA is triggered [2, 5], while in electrical stimulation of the cerebellum anticonvulsant effects are shown [1]. Most likely the primary effect is the increased synthesis of TNF in kindling, which then causes the increase in the synthesis and release of IL-1.

Proconvulsive effects of these cytokines are likely to be related to facilitation of the distribution process of EpA, but not to the reduced threshold of seizures occurrence. Our data that showed similar concentrations of TNF in conditions of the tonsil kindling in the cerebral cortex and parts of the limbic system (known for low threshold in initiation of convulsive reactions), and also in the cerebellum tissue [14] indicate possible involvement of these brain structures in the process of kindling seizure formation.

The enhancement of kindling seizure expression under the influence of TNF was proved, which indicated the fact that this compound disturbed, first of all, the central mechanisms of seizure generation. Perhaps such impact also provides an increased level of the TNF concentration in the blood. However, the final issue as to the primacy of the epileptogenic action of TNF in blood or brain has not been solved yet. Moreover, the demonstrated central effects of the investigated cytokine after its intraperitoneal injection indicate the fact of its permeability through the hemo-encephalic barrier in kindling convulsions, confirming the assumptions about the connection between inflammation and seizures, on the one hand, and the hemo-encephalic barrier permeability disturbances and convulsions on the other hand.

Conclusions.

1. The development of chronic seizures occurs with involvement of the immune system, such as members of the family of proinflammatory cytokines of tumor necrosis factor alpha and interleukin-1-beta.

Tab.

The effect of the intraperitoneal injection of TNF (5.0 mkg/kg) on the convulsive reaction in rats with electric kindling of the tonsil

Peptides	The number of rats and intensity of seizures						P, as compared to the control	Duration of kindling-induced epileptoid activity, M±m,sec.
	0	1	2	3	4	5		
Kindling, n=11	0	0	0	0	7	4	-	47.3±5.3
Kindling+TNF, n=9	0	0	0	0	2#	7#	<0.05	92.5±10.5***

Notes: reliable discrepancies of seizure intensity were counted using the statistical criterion of Kruskal-Wallis test.

# - P <0.05 - reliable discrepancies of the studied index compared to the same data in kindled rats without injection of TNF (test statistic criterion of Kruskal-Wallis).

*** - P <0.001 - reliable discrepancies of the studied index compared to the same data in kindled rats without injection of TNF (ANOVA statistic criterion).

2. The exogenous introduction of tumor necrosis factor alpha to kindled rats causes proconvulsive effect with development of generalized tonic-clonic repeated attacks, increasing the amplitude-frequency characteristics of the electrical activity of the cortex and subcortical structures of the brain, increasing its concentration in the blood and brain tissue, and also increasing the interleukin 1 content in the blood and brain tissues.

3. One of the major pathophysiological mechanisms of chronic seizures is the formation of abnormal disregulative integration of the nervous and immune systems.

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Archimedes
A body, dipped in the water does not displace anything, but many things strive to squeeze out of the body...
Idea by - B.Zhytnigor
Illustrator - Y.Simonov
International Academy of Science and Higher Education

PROTEOLYTIC SYSTEM ACTIVITY DYSFUNCTION IN CASE OF EXPERIMENTAL LIVER CIRRHOSIS

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Experimental data presented are devoted to influence of the alpha-lipoic acid and tivortin on activity of proteolytic enzymes in conditions of experimental liver cirrhosis in rats. Experimental model of CCl4-induced liver cirrhosis was shown to be accompanied by the proteolysis system activation. Both pharmacological compounds were shown to reveal the similar normalising effect resulting in the normalisation of proteolytic activity starting 6 hours after the disease induction. The therapeutic efficiency of the alpha-lipoic acid is higher than that of tivortin in case of their single administration in the modelled condition. The data obtained showed the pathogenetic importance of the proteolytic system activation in case of the experimental liver cirrhosis. The data is also an experimental background for prospects of using the tested pharmacons in the pathogenetically oriented complex correction of liver functioning in clinical conditions.

Keywords: proteolysis, liver cirrhosis, alpha-lipoic acid, tivortin, pathogenetic mechanisms, pharmacological treatment, pathogenetically oriented complex correction.

Conference participant,
National championship in scientific analytics

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Statistical indices of cirrhosis morbidity in the population, as well as other forms of destructive inflammatory affections of the liver parenchyma, are disappointing, considering the growth of patients with this pathology [1, 2]. Given this, this medical problem is important for the entire field of gastroenterology. It is clear that the topic chosen for the research is also of economic and social significance, taking into account considerable complications in this group of patients [3], rapid development of viral hepatic parenchyma affections, tumors and other common forms of the liver disease in patients of predominantly working age [4-6].

When considering the basic concepts of schemes chosen for treatment of liver cirrhosis and prevention of its complications, we proceeded from pathogenic substantiation of perspective therapeutic and preventive schemes. Based on the pathophysiological mechanisms of the general inflammatory cell response (meaning hepatocyte, of course), we know that any traumatic effect on it causes the development of a chain of biochemical, morphological and other reactions which lead to the development of inflammation with some manifestation of the inflammatory stage for some time, meaning the alternative component either exudative or proliferative one of the inflammatory process [7]. Taking into consideration the general pathophysiological mechanisms of the typical pathological inflammation process, it is clear that one of the pathogeneses of inflammatory and destructive forms of affection of the hepatic parenchyma is activation of the blood lysosomal enzymes due to dysfunction of lysosomal membranes, resulting in the powerful and active “release” of enzymes from lysosomes [8].

Important therapeutic effect in the complex treatment of inflammatory affections of the abdominal organs is caused by pharmacological compounds with anti-inflammatory properties due to their antioxidant, membrane-stimulating, energy-efficient and other effects. One of such compounds, which has these and anti-inflammatory properties is tivortin (TV) and alpha-lipoic acid (ALA), which are also characterised by hepatoprotective effects [9, 10].

Objective. Comparative study of anti-inflammatory efficacy of TV and ALA in experimental liver cirrhosis (ELC) with a focus on the dynamics of the blood proteolysis activity under their influence.

Materials and methods. The studies were conducted under conditions of chronic experiment with 180 Wister male rats. Work with laboratory animals was carried out in compliance with fundamental ethical and regulatory requirements, and provided by the European Commission for Supervision of laboratory and other experiments involving experimental animals of different species.

The model of ELC was reproduced in rats, in a toxic liver affection with a hepatotropic poison - carbon tetrachloride, which caused a direct cytolytic effect on the hepatic parenchyma [11]. CCl_4 solution was prepared from the pure (99.99% purity) drug by adding the refined sunflower oil (a final solution concentration was 50%) and administered orally using a plastic probe twice a week during 10 weeks. The animals of the comparison group (intact rats, n = 9) were administered 0.5 ml of 0.9% saline solution of NaCl orally in the similar conditions. The ELC formation was controlled laparoscopically with biopsy and subsequent histological examination of the biopsy samples in animals of both experimental and control groups.

When modelling the ELC, 45 of 171 rats died from acute liver failure (mortality rate was 26.3%). 126 rats that remained alive were divided into seven groups - 18 animals each. They were subjected to euthanasia by overdosage of aethaminalum-natrium (100 mg/kg, intraperitoneally) in 1 hour (group N1), in 6 hours (group N2), in 12 hours (group N3), in 24 hours (group N4), in 3 days (Group N5), in 5 days (group N6) and in 7 days (group N7) after the development of ELC. Blood samples were taken from all animals. In blood the activity of cathepsin D, cathepsin L, cathepsin B, trypsyn-like proteinase (trypsin), metalloproteinase carboxypeptidase A and carboxypeptidase B were determined by the conventional way [12]. But further experiments were conducted in two sessions: in the first session each group had 6 rats, which were examined using the markers of the proteolysis activity in the blood in order to determine their perspective significance in the dynamics of ELC. In the second session each group had 12 rats, which were equally administered ALA (50mg kg/i.p.) and TV (100 mg/kg/i.p.). After this the activity of proteolysis markers was determined in blood.

The data obtained was statistically calculated using the criterion ANOVA, which in case of reliability was accompanied by Newman-Keuls criterion. The minimum expected reliability was in $p <0.05$.

Results and discussion. In the dynamics of the ELC development in the rat blood in 1 hour of reproduction of the pathological condition the acidic protease activity – cathepsins of the type D, L and B - exceeded the initial data by 67%, 75% and 41% ($p <0.01$; Table. 1). Hereafter, the investigated enzyme activity continued to grow, reaching the maximum values in 12 hours of ELC modeling ($p <0.001$). Changes in the activity of neutral proteases (trypsin) also gained statistical significance, starting 1 hour after the ELC induction when its activity exceeded the initial value by 44% ($p <0.01$), and finishing by the 7th day of the pathological process, when the trypsin activity was higher than the corresponding control indices by 56% ($p <0.01$). In ELC rats without treatment, dynamics of the increased activity of metalloproteinase was less pronounced being 1.5 times higher than the corresponding reference data in 6 hours of the experiment ($p <0.05$), just like carboxypeptidase A and B, which were higher than the corresponding initial data by 40% ($p <0.05$) and 73% ($p <0.001$) in 6 hours after inducing the pathological condition, and acquired maximum activity in 24 hours after the ELC induction (Table. 1).

In the second session of studies attempts were made to identify the ALA therapeutic activity, the introduction of which caused a pronounced decrease in the activity of proteolytic and lysosomal enzymes (Table. 2). Over the course of 6 hours of ELC, ALA reduced the activity of acidic protease of the type D, L and B by 34%, 47% and 48%, respectively, as compared to such indices in rats with ELC without treatment ($p <0.01$) in the same period of time. Such absolute numerical values of the acidic protease activity were recorded during 5 days of the induced pathological condition. Approximately in the same way ALA affected the activity of trypsyn-like proteases, actual figures of which, according to the modelled conditions, were lower starting in 6 hours (by 51% less as compared to those before ALA introduction) and ending on the 5th day of the pathological process (by 36% less than without introducing ALA, in both cases $p <0.01$). To the lesser extent ALA affected indices of the metalloproteinase activity for 12 hours - 5 days (average 19% - 41%, $p <0.05$), carboxypeptidase A and B - for 12 hours - 5 days (on an average 23-41% $p <0.05$; Table. 2).

Tivortin also brought about the normalization effect on the ELC course. The data on effectiveness of TV concerning normalization of the proteolytic lysosomal enzymes during the ELC are shown in Table 3. There has been approximately the same but less when compared to the ALA impact of TV on the absolute figures, covering the activity of the proteolysis system in the blood of rats with ELC.

Thus, the course of liver cirrhosis is accompanied by activation of acidic, trypsyn-like proteases and lysosomal enzymes in the rat blood serum, indicating the spread of the inflammatory process from hepatocytes to the entire body - the generalization of the process. Activation of cathepsin D indicates the presence of inflammatory and destructive changes in the liver, which reflects the presence of systemic inflammation under the conditions of ELC.

The results obtained suggest that activation of the proteolysis system in the blood of rats is probably one of the pathogenesis links of the disease, resulting in amplified intensity of lipid peroxidation due to initiation of the

Table 1.

Dynamics of changes in proteolysis enzyme activity indices in the rat blood with reproduced experimental liver cirrhosis

Studied enzymes	**Proteolysis enzyme activity in the rat blood in different periods after reproduced ELC**							
	Initial data	1 hr	6 hr	12 hr	24 hr	3 days	5 days	7 days
Cathepsin D, mcmol/mg	0.009±0.001	0.015± 0.001**	0.041± 0.03***	0.048± 0.005***	0.042± 0.004***	0.033± 0.003***	0.016± 0.001***	0.012± 0.01**
Cathepsin L, mcmol/mg	0.48±0.04	0.84± 0.08***	2.20± 0.19***	2.75± 0.24***	2.00± 0.17***	1.44± 0.12***	0.80±0.07**	0.62±0.05*
Cathepsin B, mcmol/mg	0.062±0.005	0.088± 0.008*	0.276± 0.023***	0.286± 0.026***	0.198± 0.016***	0.144± 0.013***	0.112± 0.009***	0.086± 0.007*
Trypsin-like proteinases, mcmol/mg	0.350±0.027	0.500± 0.044**	1.100± 0.09***	1.600± 0.135***	1.900± 0.174***	1.200± 0.114***	0.900± 0.085***	0.550± 0.035**
Metalloproteinases, mcmol/mg	0.06±0.01	0.06±0.01	0.09±0.01*	0.12±0.01**	0.18± 0.01***	0.16± 0.01***	0.10±0.01**	0.07±0.01
Carboxipeptidase A, mcmol/mg	70.5±.6.6	82.7±.7.7	118±9 ***	200±17 ***	176±14 ***	134±11 ***	108±9 **	74±6
Carboxipeptidase B, mcmol/mg	770±67	920±82	1520±144 ***	1770±163 ***	1671±154 ***	1430±132 ***	1200±114 **	960±82

Note: * - $P<0.05$, ** - $P<0.01$, *** - $P<0.001$ –reliable discrepancies of the studied indices compared with the corresponding initial data (criterion of ANOVA, which was accompanied by a post hoc Student –Newman-Keuls).

Table 2.

Influence of alpha-lipoic acid on the dynamics of changes in proteolysis enzyme activity indices in the rat blood with reproduced ELC

Studied enzymes	**Proteolysis enzyme activity in the rat blood in different periods after reproduced ELC**						
	1 hr	6 hr	12 hr	24 hr	3 доби	5 діб	7 діб
Cathepsin D, mcmol/mg	0.012±0.001	0.031±0.002**	0.033±0.003**	0.022±0.002**	0.017±0.001**	0.010±0.001**	0.010±0.001
Cathepsin L, mcmol/mg	0.56±0.04	1.06±0.09**	1.00±0.09**	0.88±0.08**	0.70±0.07**	0.56±0.05**	0.52±0.04
Cathepsin B, mcmol/mg	0.068±0.005	0.106±0.009**	0.110±0.009**	0.108±0.008**	0.094±0.007**	0.080±0.007**	0.072±0.006
Trypsin-like proteinases, mcmol/mg	0.370±0.033	0.550±0.045**	0.750±0.065**	0.800±0.072**	0.700±0.065**	0.550±0.045**	0.400±0.035
Metalloproteinases, mcmol/mg	0.06±0.01	0.07±0.01	0.10±0.01**	0.12±0.01**	0.10±0.01*	0.07±0.01*	0.06±0.01
Carboxipeptidase A, mcmol/mg	73±6	98±8**	120±10**	109±10**	94±8**	87±7**	72±7
Carboxipeptidase B, mcmol/mg	810±7	1000±98*	1100±102**	1170±105**	1030±99*	920±89*	830±76

Note: * - P<0.05, ** - P<0.01 – reliable discrepancies of the indices under study compared with corresponding initial data (criterion of ANOVA, which was accompanied by a post hoc Student –Newman-Keuls).

Table 3.

Impact of tivortin on the dynamics of changes in proteolysis enzyme activity indices in the rat blood with reproduced ELC

Studied enzymes	**Proteolysis enzyme activity in the rat blood in different periods after reproduced ELC**						
	1 hr	6 hr	12 hr	24 hr	3	5 діб	7 діб
Cathepsin D, mcmol/mg	0.014±0.001	0.037±0.002**	0.036±0.003**	0.028±0.003**	0.022±0.002**	0.012±0.001**	0.010±0.001
Cathepsin L, mcmol/mg	0.62±0.05	1.17±0.09**	1.16±0.09**	0.96±0.08**	0.77±0.07**	0.59±0.05*	0.52±0.04
Cathepsin B, mcmol/mg	0.071±0.006	0.115±0.009**	0.118±0.009**	0.116±0.009**	0.109±0.009**	0.088±0.008**	0.073±0.006
Trypsin-like proteinases, mcmol/mg	0.370±0.035	0.590±0.045**	0.820±0.075**	0.970±0.088**	0.810±0.077**	0.670±0.059*	0.440±0.040
Metalloproteinases, mcmol/mg	0.06±0.01	0.09±0.01	0.13±0.01	0.18±0.01	0.15±0.01	0.09±0.01	0.06±0.011
Carboxipeptidase A, mcmol/mg	75±6	102±9**	126±11**	114±10**	102±9**	91±8**	76±6
Carboxipeptidase B, mcmol/mg	820±77	1080±98*	1200±113**	1210±116**	1180±101**	1000±98*	900±83

Note: * - P<0.05, ** - P<0.01 – reliable discrepancies of the indices under study compared with corresponding initial data in rats with ELC (criterion of ANOVA, which was accompanied by a post hoc Student –Newman-Keuls).

so-called pathological “vicious circle” that strengthens presence of lysosomal enzymes in blood, characterized by powerful destructive potential. If this happens, autocatalytic activation of the kinin–kallikrein system will occur. It will promote vasodilation, further ischemia of the liver parenchyma and the rest of the abdominal cavity [7.12]. All of the aforesaid fundamentally explains the development of the corresponding complications in the body in the course of development of cirrhosis.

We consider clinical implementation of results, explaining the normalization effect of ALA and tivortin on the proteolytic enzyme system activity in ELC, to be useful in future. Their hepatoprotective effect (as to inhibition of the proteolysis system activity) was virtually identical in the manifestation with slight advantage in ALA, and developed in 6 hours of the ELC course. Of interest may be the determined hepatoprotective effects of tivortin, the active substance of which is the amino acid L-arginine, which is a major participant of the ornithine cycle (by which the toxic ammonia binds and is converted into the non-toxic urea). Besides, L-arginine is a substrate for NO synthase - a key enzyme of NO synthesis in the endothelial cells [13].

Mechanism of action of Tivortin is associated with increasing concentrations of nitric oxide in the body. It activates guanylate cyclase, increases the level of cyclic guanidine monophsphate in the endothelium of the blood vessels, reduces activation and adhesion of leukocytes and platelets to the endothelium, inhibits protein synthesis of adhesion of VCAM-1 (vascular cell adhesion molecule-1) and MCP-1 (monocyte chemoattractant protein-1), thereby causing a general anti-inflammatory effect. The drug has hepatoprotective properties due to antioxidant, membrane stabilizing activity and, as a result, there is positive impact on energy supply processes in hepatocytes. Therefore, this drug may be promising as to further study of its hepatoprotective effects by modelling.

In our opinion, the data obtained is an experimental substantiation of expediency of the clinical testing of ALA and TV hepatoprotective effects in case of their separate application or in terms of combined administration in patients with cirrhosis. Our results allow us to expand the boundaries of experimental research in order to determine the prospects of clinical or prophylactic use of pharmaceutical compounds tested in conditions of experimental liver cirrhosis, and in similar clinical conditions.

Conclusions.

1. The course of liver cirrhosis in the rat blood serum is accompanied by activation of the acidic trypsin-like proteases and lysosomal enzymes in the rat blood serum indicating the generalization of the inflammatory process.
2. Activation of the proteolysis system in the rat blood is probably one of the pathogenetic links of proteolysis activation in the rat blood, and is probably one of the pathogeneses of the disease - liver cirrhosis.
3. Normalization of alpha-lipoic acid and tivortin impacts on activity of the proteolysis system are promising for further clinical implementation of the results.
4. The data obtained is an experimental substantiation of expediency of the clinical testing of hepatoprotective effects of alpha-lipoic acid and tivortin in cases of individual application or in combined administration in patients with liver cirrhosis.

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CORRELATION BETWEEN BEHAVIOURAL AND EEG COMPONENTS OF PRENATAL HYPOXED RATS

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Behavioural, cognitive and electrophysiological effects of prenatal hypoxia in adult rats were investigated. Prenatal hypoxia was provided by the subcutaneous injection of water solution of sodium nitrite at concentrations of 50 mg/kg of the body mass on 13-14, 18-19 or 10-19 days of gestation. Behaviour, cognitive abilities and bioelectrical activity of the brain with visual and auditory evoked potentials were evaluated. Correlation interrelations between the behaviour and EEG components of rats are revealed. It was shown that prenatal nitrite intoxication in the second half of the pregnancy period and on the embryonic day 13-14 has more pronounced effects on the CNS.

Keywords: nitrite intoxication, prenatal period, behaviour, electroencephalography, visual and auditory evoked potentials, rats.

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Currently, there is interest in examining the relationship between the characteristics of prenatal development of the diseases not only during childhood but also in adults. Prenatal hypoxia is one of the major causes of mortality of newborns and causes of neurological disturbances in adulthood [1-3]. The aim of this study was to assess behavioural, cognitive and electrophysiological effects of prenatal hemic hypoxia (PHH) during sensitive stages of brain maturation, and to explore the relationships between these effects.

Materials and methods. The behaviour, spatial memory and EEG components were studied in naive rats and in rats with a model of sodium nitrite-induced hypoxia. Pregnant rats (n=20) were subcutaneously injected with 50 mg/kg sodium nitrite on the 13th (E13) or 18th (E18) day of gestation. At the age of 3 months behaviour of offspring was assessed using the open field and Morris water maze. The open field was a round arena, 1.2 m in diameter, with radial and circular lines marked on the floor, and surrounded by 45 cm high walls. Four holes (2 cm in diameter) were cut into the floor of the arena. A video camera was mounted 1 m above the central square. Bright overhead lighting was approximately 500 lux inside the arenas, while white noise was present at approximately 60 dB. Open field testing began approximately 4 days after toluene exposure. Animals were individually placed in the centre of the arena and the following variables were recorded using the video camera during 3 min: horizontal locomotor activity (numbers of floor squares crossed, movement time, duration of immobility (resting time); vertical locomotor activity (number of rearing and climbing); number of entries in the central zone; number of hole visits; sniffing (number and duration); numbers of grooming, freezing and defecations. The sequence and durations of behavioural patterns were recorded and analysed using RealTimer (OpenScience, Moscow, Russia). The arena was carefully cleaned with alcohol and rinsed with water after each test in order to remove environmental odours. The water maze was a circular 150-cm diameter swimming pool made of white PVC and filled 30-cm deep with 26 ±1 °C water. White PVC platform (14-cm in diameter) was submerged 1.5 cm under the water surface level. The rats were brought to a waiting room at least 30 min before the experiments

Tab. 1.

Measurement of animal behaviour in open field and the Morris maze, Me (LQ; UQ)

Parameters	Possible research			
	Control n=28	E13 n=19	E 10-19 n=29	E 18 n=18
	Open field			
Sniffing	15(13;19) 52(42;71)	15(11;19) 46(38;51,5)	9,5(8;12)** 31(25;37)**	15 (11;18) 49 (35;72)
Sitting	3(2;5) 16(7,5;26)	7(4;9)** 46(23;85)**	6(5;8)** 43(23;56)**	4(2;5) 25 (13;35)
Locomotion	12 (10;14) 73(61;92)	10(5;15) 64(21;79)*	11(9;13) 77(62; 95)	11 (9;15) 76 (53;92)
Rearing	4(3;6)	4(2;6)	2,5(1;4)*	4.5 (2;6)
Freezing	1(0;1)	2(1;4)**	1(1;2)*	1 (0;2)
	Morris water maze			
Escape latency, sec	43,5(33;66)	57 (45;73)*	68 (41;78)*	28(23;69,5)

Note: above the line - number, under the line - the total duration (sec);

* - statistically significant differences as compared to the control at $p<0.05$, ** - $p \leq 0.01$.

Tab. 2.

EEG power spectral indices, (Me (LQ-UQ)

Possible research	Average amplitude, µ V	Feature ranges, %				
		δ	θ	α	β1	β2
	Sensorimotor cortex					
Control	111(89;124)	83(82;89)	12 (8;13)	3 (2;3)	1(0,5;1)	1(0,5;1)
E13	80(73;103) *	72(66;78) *	17(13;21) *	5(4;6) **	3(2;3)**	3(2;3,5) **
E10-19	92(78;109)	75(68; 84)	16(10;19)	5(2;7)	2(1;3)	2(1;2,5)
E18	103(84;128)	81(79;84)	12(10;12)	3(3;4,7)	1(1;1,5)	1(0,7;1,5)
	Visual cortex					
Control	89(78;138)	88(86;90)	8 (7;9)	3(2;3)	1(0,5;1)	1 (0;1)
E13	67 (59;74) **	84(74;87)	10 (8;12)	3(2;5)	2 (1;3) *	3 (1;4) **
E10-19	84 (80;88)	87(83;88)	9 (8;10)	2(2;7)	1(0;1,5)	1(0,7;1,5)
E18	97(74;100)	84(82;90)	9(6;11)	3(1,8;4)	1(0,7;1)	1(0,6;2)

Note: * - statistically significant differences as compared to the control at p<0.05, ** - p≤0.01.

Tab. 3.

Components of auditory and visual evoked potentials in rats (Me (LQ;UQ)

		Control	E13	E 10-19	E 18
		Visual evoked potentials			
Latency (ms)	N1	72(68; 82)	174 (151-193) **	171,5(144-210) **	170 (153-180) *
	P2	108(105;120)	253 (209-259) **	240 (191-253)**	250 (206-264) **
	N2	155(143; 168,5)	311 (283-325) **	296 (270-300) **	305 (269-318) **
	P3	205(198; 233)	337 (314-343) **	337 (311-343) **	340 (320-342) **
Amplitude (µV)	N1-P2	11,5(3-12)	17 (2-24)	17,5 (6-32)	16 (7-29,5)
	P2-N2	23,5(12-42,5)	5,5 (3,5-7) *	19 (7-30,5)	18,5 (9,5-35)
		Auditory evoked potentials			
Latency (ms)	N1	72(71; 80)	114 (90-164) *	129 (106-177) **	149 (135-216) **
	P2	111(108; 119)	212 (174-239) **	180 (159-232) **	209 (180-254) **
	N2	151(149; 166)	273 (247-283) **	247 (222-271) **	278 (272-288) **
	P3	238(265; 257)	336 (324-338) **	313 (282-332) *	318 (306-341) **
Amplitude (µV)	N1-P2	9(3-24)	19 (18-30)	10 (8-17,5)	11 (5-23,5)
	P2-N2	17,5(9-24)	4,5 (2-10,5)	19 (11,5-22,5)	9,5 (2-13)

Note: * - statistically significant differences as compared to the control at p<0.01, ** - p≤0.001.

and were kept in holding cages shortly before testing. Within 2 days each animal was placed in a water maze 4 times and latency to the platform was registered (escape latency). Once on the platform, the animal was left there for 30 sec. Between the trials, the animals were kept in holding cages for 60 sec. After four trials each day, the rats were dried with paper towels and warmed by two 75-W light bulbs.

After behaviour and spatial memory measuring rats were anesthetized (ketamine 75 mg/kg and xylazine 10 mg/kg, i.p.) and mounted in a stereotaxic frame. Stainless steel electrodes (diameter 100 µm, length 2 mm) were implanted according to Paxinos and Watson’s stereotactic atlas: 1.5-2 mm posterior to bregma and 2 mm lateral to midline (sensorimotor cortex); 1,5 mm posterior to lambda and 2 mm lateral the midline (visual cortex); 3 mm anterior to the bregma (reference). The depth of the electrodes was 2 mm. At least 1 week was given to the animals to recover from the surgery. The power spectra analysis of signals was obtained for delta (0.5–4 Hz), theta (4–8 Hz), alpha (8–13 Hz), beta 1 (13–22 Hz) and beta 2 (22-32 Hz) frequencies. Registration of visual and auditory evoked potentials (VEP and AEP) was performed using a multifunctional complex for EEG and EP “Neuron-Spectrum-4” (Neurosoft, Russia). Latencies P1, N1, P2, N2 components and interwave amplitude N1P2 and P2N3 components were analysed.

All aspects of care and treatment of laboratory animals corresponded to the European Convention for the Protection of Pet Animals (Strasbourg, 1987). The animals were kept in single breeding cages under standard conditions and were provided with food and water ad libitum.

Statistical analysis was performed using Statistica software package (StatSoft version 6.1, No. AXXR004E642326FA). The correlation between behaviour, spatial memory and EEG components was determined using the Spearman's correlation test.

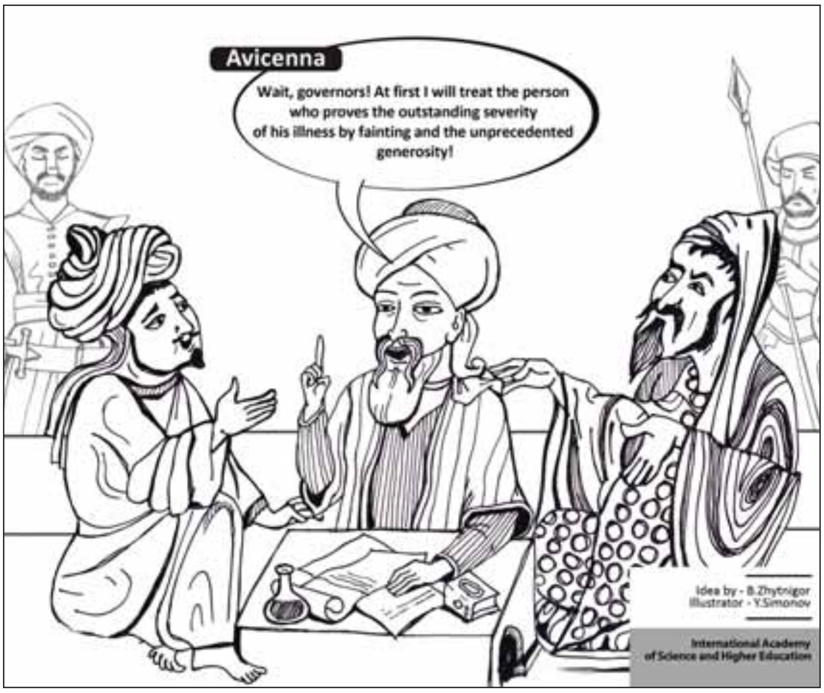
Results. The changes in behaviour and EEG components were peculiar to each period PHH. Prenatally (E10-19 and E13) nitrite exposed rats showed the decreased total locomotion in the open field and increased latency to the platform in water maze unlike hypoxed E18 rats (table 1).

Spectral analysis has shown that prenatal (E13) nitrite treatment resulted in reduction in the background amplitude, increase in EEG β1 and β2 power in visual and sensorimotor cortex (table 2).

Prenatal (E13) hypoxed rats demonstrated significantly increased latencies in N1, P2, N2 and P3 components of VEPs and AEPs ($p<0.01$) without any changes in interwave amplitudes of N1P2 and P2N2 components (table 3). Changes in the index of basic EEG rhythms and VEP and AEP were not observed in prenatally (E18) hypoxed rats.

Next, we verified whether the locomotion activity and spatial memory and EEG changes were correlated. In control rats and prenatally (E18) nitrite exposed rats we have revealed a statistically significant correlation between locomotion and the background amplitude of the visual cortex ($r=0{,}77$; $p=0.04$). The relationship between spatial memory and EEG in these groups was not detected. We found that number of correlations have increased in the group of prenatally (E13) nitrite exposed rats. Thus, we have established a statistically significant positive relationship between the locomotor activity and power δ-rhythm of the visual cortex ($r=0{,}86$; $p=0.01$). The negative correlations were found between the locomotor activity and θ-, α-, β1- β2- rhythms ($r>0{,}71$; $p<0.05$); between freezing and θ-rhythm ($r=-0{,}63$; $p=0.09$ in visual and $r=-0{,}73$; $p=0.038$ in sensorimotor cortex, respectively).

The long-term effects of prenatal hypoxia in different periods of embryogenesis are expressed in behavioural disorders, cognitive abilities and brain activity of adult experimental animals. Long-term behavioural changes following a hypoxia E18 are less pronounced than violation of VEP and AEP parameters. Prenatal hypoxia on the 13th-14th day of embryogenesis leads to disruption of the structure of individual behaviour and cognitive abilities of adult animals; changes in rhythms of the EEG spectrum capacity and VEP and AEP parameters are similar in severity to the prolonged exposure to hypoxia from 10th to 19th day of embryonic development.


Avicenna
Wait, governors! At first I will treat the person who proves the outstanding severity of his illness by fainting and the unprecedented generosity!
Idea by - B.Zhytnigor
Illustrator - Y.Simonov
International Academy of Science and Higher Education

A larger percentage of pairs with a correlation coefficient over 0.7 (>90%), detected in groups of prenatally hypoxed animals, leads to the conclusion about the stability of the formed functional state of the central nervous system. Balance required for normal functioning of CNS is achieved using the adaptive mechanisms, and the ability of the organism to maintain this balance depends on the stage of brain development, on which there is a negative impact.

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PECULIARITIES OF USING THE PHYTOPREPARATIONS IN TREATMENT OF ELDERLY PATIENTS

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Aging is a general biological condition, a result of progressing during the entire life violations of the homeostatic mechanisms of living cells and the subsequent violation of metabolic activity of cells, as well as the loss of their ability to recover. Deterioration of functional activity of the organism in the old age, presence of multimorbidity, polypragmasy, chronic course of many diseases, the propensity to self-healing and other peculiarities of the human body aged over 60 require cautious attitude when using the medicines (drugs), because at this age the drugs can bring quite different effects than in the young period; there are changes in their pharmacokinetic, pharmacodynamic aspects, biotransformation; there are several undesirable side effects unnatural for younger age, etc. Therefore, in old age, the use of herbal remedies and medicinal plant raw materials (mprm), standardized and certified in accordance with the requirements of modern European legislation is especially reasonable.

Keywords: drug, herbal, medicinal plant raw material, elderly patient, geriatric patient.

Conference participants

ОСОБЕННОСТИ ПРИМЕНЕНИЯ ФИТОПРЕПАРАТОВ ПРИ ЛЕЧЕНИИ ПАЦИЕНТОВ ПОЖИЛОГО ВОЗРАСТА

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Старение является общебиологическим состоянием, следствием прогрессирующег в течение жизни нарушения гомеостатических механизмов живых клеток и последующим нарушением обмена веществ, деятельности клеток, а также потери их способности к восстановлению. Ухудшение функциональной активности организма в пожилом возрасте, наличие полиморбидности, полипрагмазии, хроническое течение многих заболеваний, склонность к самолечению и другие особенности организма человека старше 60 лет, требует осторожности при использовании лекарственных средств, поскольку именно в этом возрасте лекарства действуют совершенно по-другому, чем в молодом периоде; меняются их фармакокинетические, фармакодинамические аспекты, биотрансформация; возникают ряд нежелательных побочных эффектов, нехарактерных молодому возрасту и пр. Поэтому в пожилом возрасте, особенно оправдано применение фитопрепаратов, лекарственного растительного сырья, стандартизированных и сертифицированных в соответствии с требованиями современного европейского законодательства.

Ключевые слова: Лекарственное средство (ЛС), фитопрепараты, лекарственное растительное сырье (ЛРС), пациент пожилого возраста, гериатрический пациент.

Участники конференции

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Сложность и многообразие патологий старого человека требуют разностороннего лечения. Альтернативой современным методам фармакотерапии можно рассматривать фитотерапию. Растительные лекарства, за исключением сильно действующих, безопасны в применении и проявляют мягкое, щадящее действие. Известно, что пожилые люди часто демонстрируют нежелание употреблять химические вещества, в то же время они готовы принять лекарства растительного происхождения, рассматривая их как естественные и такие, к которым у них возникает эффект доверия.

Однако использование современных фитопрепаратов с доказанной терапевтической эффективностью не может рассматриваться гарантом того, что организм пожилого человека (в силу индивидуальных особенностей) не даст негативной реакции-ответа на введение того или иного препарата. По этим причинам, фитопрепараты должны применяться строго по рекомендации лечащего врача и под его контролем.

При применении лекарственных средств (ЛС), в т.ч. растительного происхождения, в практике гериатрических больных следует учитывать основные принципы рациональной фармакотерапии: фармакотерапия должна быть строго обоснованной и направленной на лечение заболевания, которое определяет тяжесть состояния больного; это позволит исключить полипрагмазию; необходимо использовать минимум лекарств, применяемых при лечении основного заболевания; следует учитывать их взаимодействие; способ приема лекарства должен быть простым и доступным; в пожилом и старческом возрасте ЛС могут иметь отрицательное (побочное) действие на органы в значительно большей степени, чем у людей зрелого возраста или проявлять свои свойства атипично; устойчивость к интоксикации в пожилом и старческом возрасте значительно снижена, интоксикация опасна даже при небольшом действии токсических метаболитов и ЛС; необходимо учитывать психическое состояние человека (обеспечить больного письменными рекомендациями), его социальные условия; в данной группе больных дозу препарата доводят до рекомендуемой постепенно до достижения лечебного эффекта (сердечные гликозиды, седативные, гипотензивные, нейролептики; начальные дозы этих препаратов необходимо уменьшить в два раза по сравнению с дозами для людей среднего возраста); по достижении лечебного эффекта дозы необходимо уменьшить и назначить поддерживающую терапию; необходимо учитывать водный и солевой рацион больных, количество выделяемой мочи; недостаточное употребление жидкости пожилыми пациентами способствует развитию лекарственной интоксикации; долговременное употребление успокоительных, анальгетиков, снотворных ЛС вызывает привыкания, и для получения терапевтического эффекта больные увеличивают дозу, что способствует развитию лекарственной интоксикации; по этой причине препараты этих фармакологических групп необходимо назначать на короткий срок и проводить частую замену одних ЛС другими с аналогичным действием и по возможности делать перерывы в приеме; для снижения токсичности и усиления эффективности рекомендуется назначать в малых дозах ряд фармакологических препаратов, которые дают подобный фармакотерапевтических эффект, дополняя другими, но действующими на различные звенья саморегуляции организма; врожденная или приобретенная повышенная чувствительность к некоторым ЛС может наблюдаться во всех возрастных периодах; частым осложнением фармакотерапии у людей старших возрастных групп бывает медикаментозная аллергия; для профилактики и лечения преждевременного старения необходимо проводить комплексную витаминотерапию, направленную на стимуляцию и поддержания метаболических процессов и функций организма больных; витаминотерапию необходимо расценивать как фактор, которой уменьшает риск развития лекарственной интоксикации и других побочных реакций в пожилом и старческом возрасте.

Поэтому в практику фармакотерапии пожилых людей постепенно внедряют фитопрепараты. Важной особенностью лекарственных растений является то, что они быстрее и активнее включаются в биохимические процессы человеческого организма, чем химические, чужие для организма синтетические средства. Преимущество ЛРС заключается также в том, что они, в отличие от официальных фармакологических препаратов, редко вызывают осложнения, особенно аллергические реакции. Лекарственные растения, нормализуя функции отдельных органов и систем, положительно влияют на обмен веществ в организме. Возможность длительного применения при хронических заболеваниях в сочетании с низкой стоимостью привлекает к себе внимание многих, особенно пожилых людей.

Характерным для лекарственных растений и полученных из них биологически активных веществ является широкий спектр их фармакологического действия. Например, активные вещества жень-шеня, лимонника китайского, элеутерококка влияют на нервную и сердечнососудистую системы, функцию эндокринных желез, улучшают рефлекторную деятельность нервной системы. Некоторые официальные растения способны стимулировать активность отдельных органов и систем организма благодаря возбуждающему действию. Так, например, кофеин, который содержится в листьях чая или зернах кофе, проявляет стимулирующее действие на ЦНС, а через нее - на весь организм. Некоторые травы способны проявлять обще тонизирующее, адаптогенное действие. Они тонизируют жизненные процессы, нормализуют кровообращение, дыхание, пищеварение, повышают способность человека приспосабливаться к стрессовым ситуациям (элеутерококк, жень-шень, аралия, лимонник китайский, родиола, арника, горечавка).

Отдельно следует выделить преимущества фитотерапии, что в суммарном случае, особенно при лечении пожилых пациентов, приобретают значимость:

- основным преимуществом фитотерапевтических средств считается их меньшая токсичность и меньшее количество побочных эффектов;

- фитотерапевтические средства значительно дешевле;

- фитотерапевтические препараты больной может приготовить в домашних условиях.

Основным заданием фитотерапии при этом считается улучшение показателей качества здоровья пожилого человека - определяющего фактора формирования потребности в медицинской и социально-бытовой помощи, лекарственного обеспечения, фармацевтической и фитотерапевтический помощи.

Приведем некоторые примеры практического применения фитотерапии для профилактики, реабилитации и лечения пожилых пациентов.

Как известно, сердечно-сосудистые заболевания являются основной причиной инвалидности и смертности людей в большинстве стран мира. Градация препаратов растительного происхождения, действующих на систему кровообращения, основывается на клинических критериях и охватывает лекарства, которые применяются при отдельных симптоматических синдромах: гипотония, гипертония, ишемическая болезнь сердца (ИБС), сердечно-сосудистый атеросклероз и пр.

Так, при лечении гипотонии хорошо зарекомендовала себя настойка и экстракт левзеи. Принимается за 30 хв. до завтрака и обеда, обязательно на голодный желудок, дозировка - 20-30 капель.

Другие фитотерапевтические прописи, активные в практике фитотерапии гипотонии, приведены ниже:

- Возьмите корень аралии и 70% спирт в соотношении 1:5, дайте настояться. Принимайте 3-4 раза в день, дозировка - 30-40 капель;

- Возьмите корень высокой заманихи и 40% спирт в соотношении 1:5, дайте настояться. Принимайте 2 раза в день, дозировка - 30-40 капель;

- Полезен при гипотонии экстракт родиолы. Его принимают за полчаса до еды 2-3 раза в день, дозировка - 5-10 капель, курс - 10-20 дней;

- Настой из 200 мл кипятка и 20 г травы едкого очитка. При гипотонии: 3 раза в день по 1 столовой ложке;

- Отличная профилактика гипотонии - травяной сбор состава: 6 ч. плодов шиповника, 2 ч. травы спорыша, 4 ч. листьев подорожника, 2 ч. листьев мяты, по 4 ч. травы будры, 1 ч . плодов можжевельника, 14 ч. травы зверобоя, 4 ч. душицы, по 2 ч. травы дрока и вербены, 1 ч. корня аира. На 500 мл кипятка берется 2-3 столовых ложки полученной смеси, все переливается в термос и настаивается до следующего дня. Настой разделить на 3 равные части и выпить в течение дня за 20-40 минут до приема пищи.

Как видно, в прописях используют лишь оффициально зарегестрированное сырье, сертифицированное и стандартизованное согласно действующему законодательству Украины.

Гипертоническая болезнь - это заболевание с преимущественно хроническим течением. В большинстве случаев она развивается у лиц старше сорока лет, причем довольно медленно. Наряду с классической медициной, очень широко применяется лечение гипертонической болезни травами, причем разные народные методы дают достаточно хорошие результаты.

- Полезными при гипертонической болезни ванны с добавлением отвара валерианы (при этом на 1 ванну берется 0,5 кг корня валерианы);

- Актуальной при гипертонической болезни является настойка из цветков календулы - залить их спиртом в пропорции 2:100 и дать настояться. Принимать 3 раза в день, дозировка - 20-40 капель;

- Хорошо зарекомендовал себя густой сок хурмы. Пить его можно ежедневно, причем в достаточно больших количествах - по 2-3 стакана;

- При гипертонической болезни полезно в течение 10 дней за полчаса до еды принимать 50 г плодов черноплодной рябины. В холодное время года можно заменить плоды настойкой, которая готовится следующим образом - положить 2-3 столовые ложки сухих или свежих плодов черноплодной рябины в термос, залить 2 стаканами кипятка, оставить до следующего дня. Все содержимое делится на три равных приема и выпивается в течение дня за полчаса до еды. Черноплодная рябина противопоказана тем, кто страдает артериальной гипотонией, язвой двенадцатиперстной кишки и желудка, гастритами, а также тем, у кого наблюдается повышенная свертываемость крови.

Кроме этого, широко представлен на фармацевтическом рынке Украины официально зарегистрированный перечень растительных стандартизованных препаратов. Так, в практике ккардиологии хорошо зарекомендовали себя:

- Адонис-бром (таблетки) – при легких формах хронической СН, НЦД кардиального типа, неврозах - по 1 табл. 3 раза в день. Курс определятся индивидуально;
- Биовиталь (капли, раствор, драже) – поливитаминное ЛС – при заболеваниях сердечнососудистой и нервной систем, длительных напряжениях и стрессах. Курс определятся индивидуально;
- Валокормид (капли) – седативное средство, при сердечно-сосудистых неврозах с ярко выраженной брадикардией – по 10-20 капель 2-3 раза в день до еды;
- Гербион (сердечные капли) – кардиотоник – для пациентов пожилого возраста при неврозах сердца, легкой СН, легкой гипертонии – по 20-30 капель 3 раза в день. Капли развести в ложке воды, принимать после еды;
- Геровитал (раствор) – поливитаминное ЛС – при длительных физических и нервных нагрузках для лиц пожилого возраста – по 1 соловой ложке 2 раза в день до или во время еды;
- Настойка боярышника – при функциональных расстройствах деятельности сердечно-сосудистой системы, как дополнительное средство при легких формах нарушения ритма и на начальных стадиях АГ – по 20 капель 3 раза в день до еды;
- Экстракт элеутерококка – для профилактики и лечения гипотонии, неврастении – по 10-20 капель в день за 20-30 минут до еды в первой половине дня в течение 3 недель;
- Кардиофит (настойка) – спазмолитик – при лечении НЦД, неврозах сердца, ИБС – по 5 мл 2-3 раза в день за 3- мину до еды;
- Корвалол (капли) – при комплексной терапии гипертонической болезни, не резко выраженных спазмах коронарных сосудов, тахикардии – по 15-30 капель 2-3 раза в день с водой или на грудочке сахара;
- Капли Зеленина – при вегетативных неврозах, легкой форме хронической СН – по 20-25 капель 2-3 раза в день;
- Кратал (таблетки, капли) – комбинированное кардиологическое средство – для лечения НЦД, при хронической ИБС – по 1 табл. 3 раза в день перед едой.

Материал, изложенный выше, можно рассматривать как наглядный пример того, что в действительности фитотерапия проверенными качественными травами и препаратами из них довольно часто выступает альтернативой современным официальным способам лечения. Анализ современного состояния аптечного арсенала показывает, что препараты растительного происхождения занимают порядка 20-24% всего ассортимента и пользуются широким спросом среди населения. Особенно актуальны данные препараты в практике гериатрии. Такие препараты выступают часто как средства вспомогательной, поддерживающей терапии, которые легче переносятся больными пожилого возраста и проявляют меньше осложнений.

Современные требования к растительным препаратам, утвержденные на уровне ВООЗ и закрепленные рядом Директив по их качеству, эффективности, безопасности, все-таки требуют проведения надлежащего уровня стандартизации и сертификации растительных компонентов, которые официально будут использоваться в дальнейшем для лечения и профилактики различных недугов. В связи с этим, вопрос фитотерапевтического подхода при фармакотерапии пожилых людей приобретает особую актуальность и значимость.

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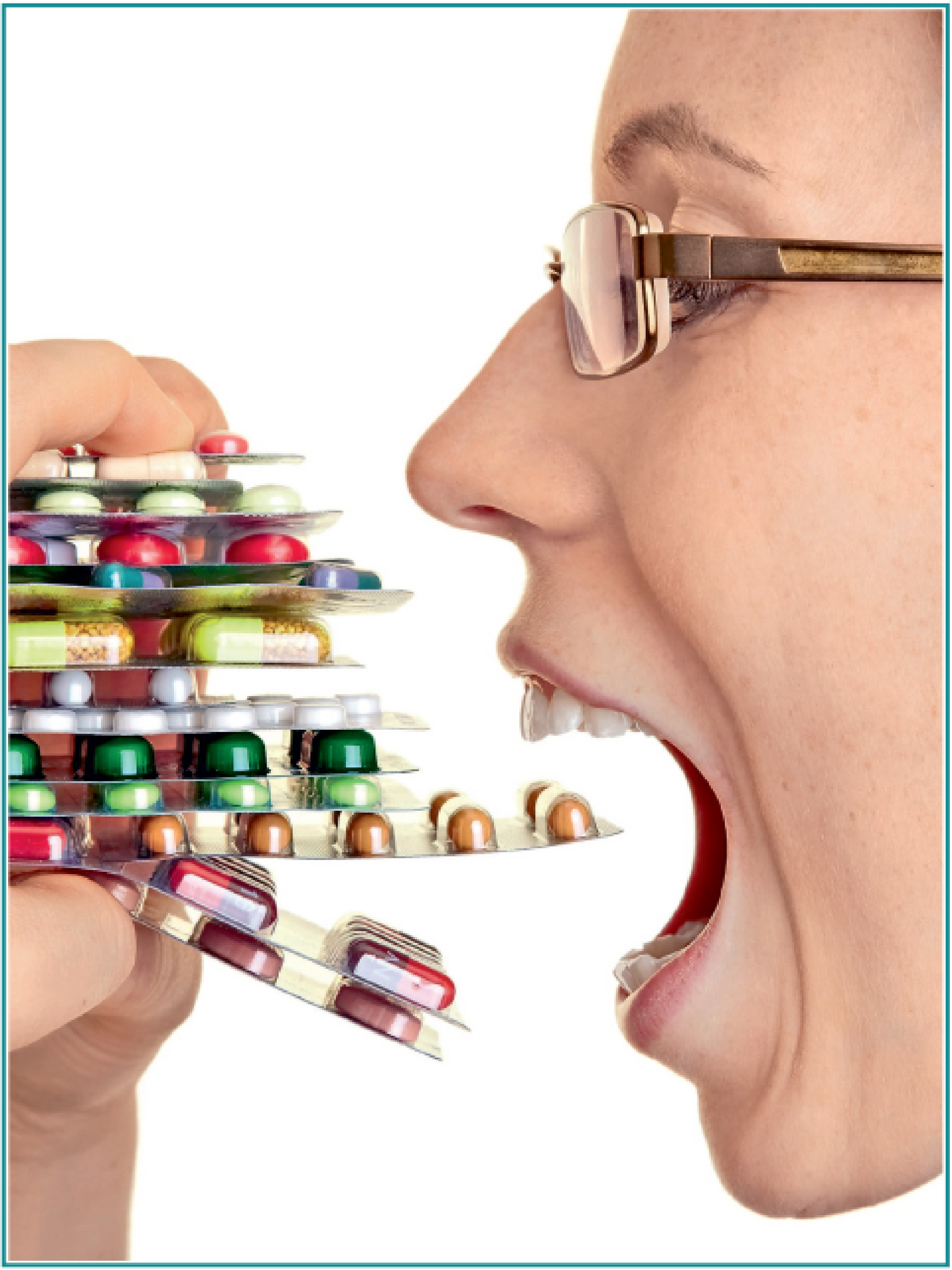

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